



ARCHIVES OF

*Physical Medicine  
and  
Rehabilitation*

3rd International Congress of Physical Medicine  
IIIe Congres international de Medecine Physique  
3° Congreso internacional de Medicina Fisica  
3. internationaler Kongress für Physikalische Medizin

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*August 21-26, 1960*

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# ARCHIVES OF *Physical Medicine and Rehabilitation*

OFFICIAL JOURNAL

AMERICAN CONGRESS OF PHYSICAL MEDICINE AND REHABILITATION

AMERICAN ACADEMY OF PHYSICAL MEDICINE AND REHABILITATION



30 N. Michigan Avenue, Chicago 2, Illinois

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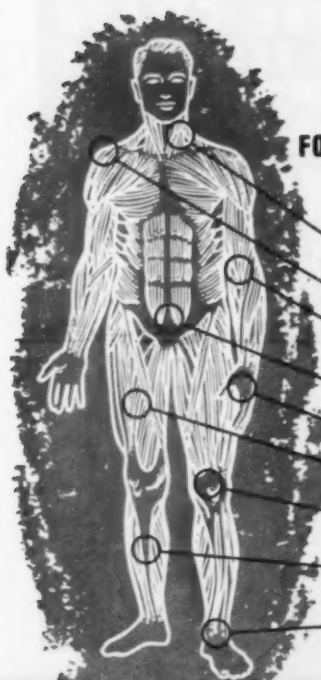
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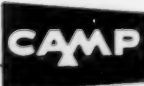
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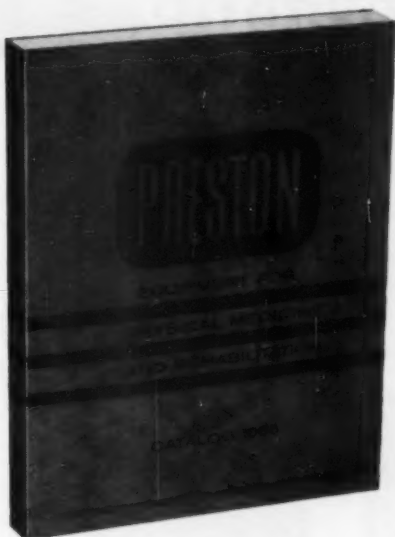
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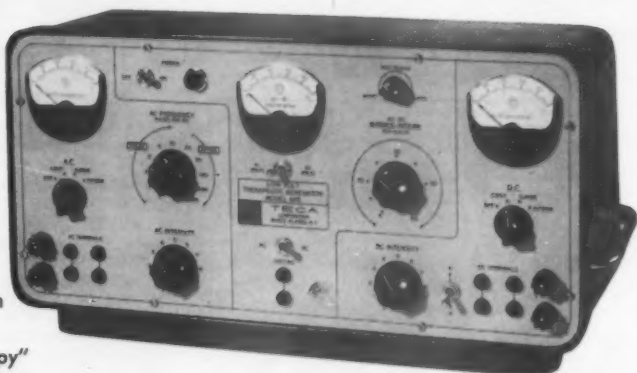
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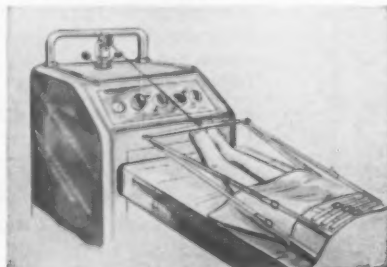
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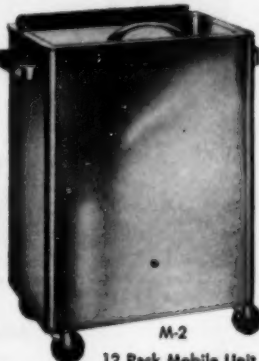


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3rd International Congress of Physical Medicine  
IIIe Congres international de Medecine Physique  
3° Congreso internacional de Medicina Fisica  
3. internationaler Kongress für Physikalische Medizin



# *The Mayflower*

WASHINGTON, D. C.

U. S. A.

AUGUST 21-26, 1960



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3rd INTERNATIONAL CONGRESS OF PHYSICAL MEDICINE

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*preliminary program and general information*

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**Countries Represented by Delegates  
at the First and Second International Congresses**

Argentina	France	Portugal
Australia	Germany	Spain
Austria	Iceland	Sweden
Belgium	Israel	Switzerland
Brazil	Italy	Turkey
Canada	Netherlands	Union of South Africa
Czechoslovakia	New Zealand	United Kingdom
Denmark	Norway	United States of America
Finland	Peru	Yugoslavia



**History**

Wednesday, May 10, 1950 saw the establishment of the International Federation of Physical Medicine. It was on this day a small group of physiatrists met at the Royal Society of Medicine in London to set up an interim committee to organize the First International Congress of Physical Medicine to be held in London, England in July, 1952. Representatives of associations of physicians concerned with physical medicine from 15 nations convened on July 13, 1952 and formally constituted the Federation. Countries having national associations of physical medicine became Founder Members. Associations from two other nations were given Provisional Membership, and seven additional nations sent observers or expressed a desire to support the newly founded Federation. It was agreed that full membership in the congresses of the Federation should be restricted to qualified physicians and surgeons. Dr. Frank H. Krusen became the first President of the Federation; Dr. Philippe Bauwens was elected the first Honorary Secretary; Dr. Hugh Burt was elected the first Honorary Treasurer; and subsequently, Dr. A. C. Boyle of Great Britain was appointed Assistant Honorary Secretary. The permanent offices of the Federation were established in London at 47, Lincoln's Inn Fields.

Under the patronage of His Royal Highness, The Duke of Gloucester, the 1st International Congress of Physical Medicine opened on Monday, July 14, 1952. This first congress was under the presidency of Lord Thomas Jeeves Horder of Great Britain.

The 2nd International Congress conducted by the Federation convened in Copenhagen on Sunday, August 19, 1956. Her Gracious Majesty, Queen Ingrid, Patroness, was present at the opening ceremony in the Festival Hall of the University of Copenhagen. Delegates

from the physical medicine societies of 15 nations were represented officially at this meeting and delegates from six new countries were added to those sending representatives from member associations.

Washington, D. C., the capital city of America, provides a jewel-like setting for the 3rd International Congress of Physical Medicine, August 21-26, 1960. This third congress has as its patron The Honorable Richard M. Nixon, The Vice President of the United States. Serving as its patroness is Mrs. Richard M. Nixon.

The official languages of the 3rd Congress are English, French, German and Spanish. Simultaneous translation will be made in all four languages at the plenary sessions only. An extensive arrangement of scientific and commercial exhibits will be displayed. Scientific films on subjects within the scope of the Congress are scheduled. As at previous congresses, members and social associate members will be in attendance. Paramedical associate membership is open to affiliates of recognized medical auxiliary groups. The Mayflower is headquarters hotel for this meeting. All of the rooms reserved for this congress and its special functions are air-conditioned to provide for maximum comfort.

International accord and mutual understanding has characterized the previous meetings of the Congress. The 3rd Congress hopes to achieve new heights of international felicity through our continuing efforts to promote the health of all mankind through the physical treatment and rehabilitation of handicapped persons throughout the world.



## GENERAL INFORMATION

### Date of the Congress

The 3rd International Congress of Physical Medicine convenes in Washington, D. C., U. S. A., August 21 through August 26, 1960, at The Mayflower.

### Business Meetings of the International Federation of Physical Medicine

At 3:00 p.m. on Sunday, August 21, a meeting of the delegates will be called to receive a report from the Interim Committee of the International Federation of Physical Medicine, to adopt and draft regulations and to elect the officers of the International Federation of Physical Medicine. These officers will subsequently take office and conduct the business of the Federation in accordance with the regulations and will report to the general meeting scheduled for 2:00 p.m. on Friday, August 26.

### Opening Ceremony

The Opening Ceremony will take place on Monday, August 22, at 10:00 a.m. in the Departmental Auditorium, U. S. Department of Labor, Constitution Avenue between 12th and 14th Streets. The officers of the Congress will wear academic dress on this occasion.

### Registration Desk

The Registration Desk will be located at The Mayflower, and will be open at the following times:

Saturday, August 20 .....	2:00 p.m. to 6:00 p.m.
Sunday, August 21 .....	10:00 a.m. to 9:00 p.m.
Monday, August 22	} ..... 8:00 a.m. to 5:00 p.m.
Tuesday, August 23	
Wednesday, August 24	
Thursday, August 25	
Friday, August 26 .....	8:30 a.m. to 12:00 noon

### Official Languages

The official languages of the Congress will be English, French, German, and Spanish. Simultaneous translation of plenary sessions will be made in these languages.



### Registration

Medically qualified practitioners who are either members of a Physical Medicine Society or sponsored by a national Physical Medicine Society are eligible for registration as *members* of the Congress. Where difficulty is encountered in obtaining sponsorship, the advice of the Secretary General of the Congress should be sought.

Relatives and friends of members may be registered as *social associates*. They will be entitled to attend the opening and closing ceremonies, to visit the scientific and technical exhibits, as well as participate in all social functions.

*Paramedical associate membership* is open to members of recognized paramedical professions. Such associates may attend the opening and closing ceremonies, the scientific sessions, the scientific and technical exhibits and the receptions. They may not introduce social associates. The number of paramedical associate members must necessarily be limited and the Executive Committee therefore reserves the right to reject applications.

No application will be accepted from anyone who is not a member of a Physical Medicine Society unless accompanied by a letter of sponsorship from a recognized medical society.



### Registration Fees

Member .....	\$25.00
Social Associate Member .....	20.00
Paramedical Associate Member .....	10.00

Residents in approved PM&R residency programs may register at the special rate of \$5.00. This category of registration includes attendance at scientific sessions as well as viewing of scientific and technical exhibits and scientific films. *Participation in any scheduled social functions is not included.*

Because the banquet hall can accommodate a specific size group, only a limited number of dinner tickets will be available for purchase for persons other than members and/or social associate members for whom the cost of dinner and all social functions is included in the registration fee.

Members who enroll early and are subsequently prevented from attending the Congress will have their registration fees refunded, less 20%, provided their cancellations are received by August 1, 1960. *Date of cancellation request received in the Congress office will be considered final.*

### Scope of the Congress

In accordance with the provisional regulations of the International Federation of Physical Medicine, the meetings of the Congress will be devoted to the clinical, remedial, prophylactic and educational aspects of physical medicine and with the diagnostic and therapeutic methods employed in physical medicine and rehabilitation.

### Outline of Scientific Program

#### Monday, August 22

Afternoon — *Electromyography and electrodiagnosis*  
*Education for physical medicine*  
*Balneology*

#### Tuesday, August 23

Morning — *Arthritis and collagen diseases*  
*Electromyography and electrodiagnosis*  
*Medical problems diagnosed or treated by physical medicine*

Afternoon — *Scoliosis*  
*Diseases of skeletal muscle*  
*Arthritis and collagen diseases*



**Wednesday, August 24**

Morning — *Neuromuscular diseases*  
*Balneology*

Afternoon — *Open for tours in Washington and surrounding areas, or at leisure*

**Thursday, August 25**

Morning — *Physiatric care following trauma to the neuromuscular and musculoskeletal systems*  
*Neuromuscular diseases*

Afternoon — *Medical problems diagnosed or treated by physical medicine*  
*Role of government in rehabilitation (panel discussion)*  
*Cerebral palsy*  
*Medical problems diagnosed or treated by physical medicine*

**Friday, August 26**

Morning — *Orthotics and prosthetics*  
*Medical problems diagnosed or treated by physical medicine*

Afternoon — *Final business meeting of Federation*

**Local Reception and Social Events**

A comprehensive and varied social program is planned for members and social associates of the 3rd International Congress of Physical Medicine during the week of August 21, 1960.

The events already planned include receptions by various official bodies, an International Banquet at The Mayflower in Washington, a reception at the National Gallery of Art, and visits to the many points of interest in Washington, D. C. There will be tours for the physicians and their wives which they may enjoy together the numerous sites of historical and national interest. There are three medical schools in the District (Washington, D. C.) and a large number of hospitals including federal, private, and university institutions. Physicians will have the opportunity to visit many of these medical centers as well as institutions of international recognition such as the National Institutes of Health and the Armed Forces Institute of Pathology. Social functions and entertainment are planned for the ladies. Also nightclubs, theaters, famous dining places and private clubs will be open to make your visits most enjoyable.

You will find courteous and warm hospitality, culture, social entertainment, outstanding shopping facilities, modern and adequate hotel accommodations and transportation at the meeting place of the 3rd International Congress.

The local Reception Committee will provide every possible assistance to help you obtain the greatest possible enjoyment and benefit from your visit. An information booth will be located in the registration area of The Mayflower where you may receive detailed information concerning all activities.

Tickets for dinners and receptions will be issued at the time of registration. Evening dress with decorations, or dinner jackets will be worn at evening functions.

**Accommodations and Travel**

The American Express Company, Inc. has been appointed the official agent for this Congress.

**Bank**

The American Express Company, Inc. will have a representative available at the Registration Desk to cash travellers' checks and letters of credit and effect foreign exchange.

**Climate**

The weather in Washington in August is warm. Light weight summer clothing is adequate.



**Suggested Post-Congress Tours**  
**to**  
**Williamsburg, Richmond, Philadelphia, New York**  
(\$244.00 — U. S. A.)

- |   |  |
|---|--|
| <b>Sunday</b><br><b>August 28th</b>     | Depart morning from Washington, D. C. by special motorcoach to Williamsburg, Va. Trip takes 3½ hours through scenic and historic sites of Colonial Virginia. On arrival transfer to hotel Williamsburg Inn for room accommodations with bath. Afternoon sightseeing tour of Williamsburg.  |
| <b>Monday</b><br><b>August 29th</b>     | Depart morning from Williamsburg by special motorcoach to Richmond, Va. Trip takes 1½ hours. On arrival transfer to Hotel Richmond for room accommodations with bath. Afternoon sightseeing tour of Richmond.  |
| <b>Tuesday</b><br><b>August 30th</b>    | Entire day will be devoted to scientific visits in Richmond including Medical College and McGuire VA Hospital.   |
| <b>Wednesday</b><br><b>August 31st</b>  | Depart morning from Richmond by special motorcoach to Philadelphia, Pa. Trip takes 7 hours. On arrival transfer to Hotel Benjamin Franklin for room accommodations with bath.  |
| <b>Thursday</b><br><b>September 1st</b> | Entire day will be devoted to scientific visits in Philadelphia.   |
| <b>Friday</b><br><b>September 2nd</b>   | Depart morning by special motorcoach to New York; trip takes 2 hours. On arrival transfer to Hotel Taft for room accommodations with bath. Afternoon will be devoted to scientific visits in New York.   |
| <b>Saturday</b><br><b>September 3rd</b> | Depart morning by special motorcoach to Haverstraw, N. Y., where an inspection will be made of the State Rehabilitation Hospital. The trip takes 1½ hours. During the early afternoon the motorcoach will take the route towards West Point where an inspection and sightseeing tour will be made of the Academy grounds. Return to New York in the evening. |
| <b>Sunday</b><br><b>September 4th</b>   | Entire day will be devoted to sightseeing tour of uptown New York with Harlem and downtown New York with Chinatown.  |
| <b>Monday</b><br><b>September 5th</b>   | Tour terminates after breakfast at hotel.  |

**3rd INTERNATIONAL CONGRESS OF PHYSICAL MEDICINE****Preliminary Program**

*This preliminary program (scientific papers, films and exhibits) will be revised by the Program Committee prior to the official opening of the conference.*

**MONDAY, AUGUST 22****SESSION ON ELECTROMYOGRAPHY**

*Afternoon*

**Grand Ballroom**

Chairman — Svend Clemmesen, Copenhagen, Denmark

Co-chairman — Albin T. Jousse, Toronto, Ontario, Canada

**Electrodiagnosis Revisited: Tenth John Stanley Coulter Memorial Lecture.**

*(In English)*

DR. PHILIPPE BAUWENS, St. Thomas' Hospital, London, England.

**Excitability and Conduction Velocity of Motor Nerves in Neuromuscular Disease.**

*(In English)*

EDWARD LAMBERT, M.D., Mayo Clinic, Rochester, Minnesota.

*Introduced by Earl C. Elkins, M.D., Rochester, Minnesota.*

**Mechanical Properties and Temperature of Intact Skeletal Muscle in Patients with Muscular Dystrophy. *(In English)***

STELLA Y. BOTELHO, M.D.; ELEANOR BENDLER, M.D., and SIBYL B. BECKETT, M.S., Graduate School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania.

**Motor Nerve Conduction Velocity in "Idiopathic" Polyneuritis. *(In English)***

DOMINGO CERRA, M.D., and ERNEST W. JOHNSON, M.D., Division of Physical Medicine and Rehabilitation, University Hospital, Ohio State University, Columbus, Ohio.

**Electromyographic Kinesiology of the Hand: Part II. Third Dorsal Interosseus and Extensor Digitorum of the Long Finger. *(In English)***

CHARLES LONG, II, M.D.; MARY E. BROWN, R.P.T., and GERALD WEISS, Highland View Hospital, Cleveland, Ohio.

**SESSION ON EDUCATION**

*Afternoon*

**Colonial Room**

Chairman — Guy Fisk, Montreal, Quebec, Canada

Co-chairman — Wassil N. Bakardjiew, Sofia, Bulgaria

**Educational Aspects of Physical Medicine in the Training of Physical Therapists in Brazil. *(In English)***

ROBIN FORDYCE HINDLEY-SMITH, M.D.; ROBERTO TALIBERTI, M.D., and JOSE RODRIGUES LOUZA, Instituto de Reabilitacao, Sao Paulo, Brazil.

**The Teaching and Training of Blind Physiotherapists. *(In English)***

DR. CLIVE SHIELDS, London, England.

**Undergraduate Medical Student Teaching of Physical Medicine and Rehabilitation in the United States. (*In English*)**

JOSEPH G. BENTON, M.D., NYS Downstate Medical Center, Brooklyn, New York.

**Education and Training of Medical and Non-Medical Personnel in Physical Medicine and Rehabilitation.**

DR. BRYNJULF STRANDBERG; DR. KAI JESPERSEN, and DR. B. SURY, Hellerup, Denmark.

**SESSION ON BALNEOLOGY**

*Afternoon*

**North Room**

Chairman — Heinrich Lampert, Hoxter/Weser, West Germany  
Co-chairman — Hans Behrend, New York, New York

**Ankylosing Diseases of the Spine and Physical Medicine. (*In English*)**

DR. VICTOR R. OTT, Bad Nauheim, West Germany

**Importance of Partial Hydrotherapy (Kneipp-Treatment) for the Prevention and Rehabilitation of Arthritis and Collagen Diseases of the Vascular System. (*In German*)**

DR. KURT FRANKE, Kirchberg, West Germany.

**Results of Six Years' Experimental Balneotherapy in 60 Cases of Ankylosing Spondylitis.**

PROFESSOR FRANTISEK LENOCH; DR. PETR TRUHLAR, and DR. ZDISLAVA POLAKOVA, Institute of Physical Medicine and Balneology, Charles University, Prague, Czechoslovakia.

**A Decade of Team Work in Rehabilitation in a Medically Controlled Nursing Home.**

HANS J. BEHREND, M.D., Director, Physical Medicine and Rehabilitation, Beth Abraham Home, New York, New York. *Read by title.*

**TUESDAY, AUGUST 23**

**SESSION ON ARTHRITIS**

*Morning*

**Grand Ballroom**

Chairman — Victor R. Ott, Bad Neuheim, West Germany  
Co-chairman — Hugh Burt, London, England

**Recent Progress in the Collagen Diseases. (*In English*)**

EDWARD W. LOWMAN, M.D., Institute of Physical Medicine and Rehabilitation, New York, New York.

**Effect of Short Wave Diathermy on Radio-Sodium Clearance from the Knee Joint in the Normal and in Rheumatoid Arthritis. (*In English*)**

DR. RONALD HARRIS, Buxton, Derbyshire, England.

**Rehabilitation of the Chronic Arthritic Patient by Relief of Joint Pain with Extended Sympathetic Denervation: A Five Year Study. (*In English*)**

ROBERT A. HERFORT, M.D., White Plains, New York.

**Non-Articular Rheumatism with Special Reference to the Problem of Classification. (*In English*)**

DR. RICHARD WADE BARTER, Kent, England.

**Analysis of Sounds from Normal and Pathologic Knee Joints. (*In English*)**

HERBERT FISCHER, M.D., and ERNEST W. JOHNSON, M.D., Division of Physical Medicine and Rehabilitation, Department of Medicine, Ohio State University, Columbus, Ohio.

**Beitrag zur Therapie des Schulter-Handsyndromes.**

DR. MED. OBERARZT DURI GROSS, Kantonsspital Zurich Schweiz, Univ. Institut f. physik. Therapie, Zurich, Switzerland.

**SESSION ON ELECTROMYOGRAPHY**

*Morning*

**Colonial Room**

Chairman — Brynjulf Strandberg, Hellerup, Denmark

Co-chairman — Alvaro Ferrare-Forcade, Montevideo, Uruguay

**Critical Factors in Electromyographic Instrumentation. (*In English*)**

JOSEPH B. ROGOFF, M.D.; EDWARD F. DELAGI, M.D., and ARTHUR S. ABRAMSON, M.D., Bronx Municipal Hospital Center, Albert Einstein College of Medicine, New York, New York.

**Kinesiologic Effects of Sensory Stimulation to the Temporomandibular Joint and Related Oral Structures. (*In English*)**

SIDNEY I. SILVERMAN, D.D.S., New York, New York.

**Paramyotonia Congenita, Clinical Features and Electromyographic Findings. (*In English*)**

WILLIAM J. LA JOIE, M.D., Phoenix, Arizona.

**Electrodiagnosis and Electrical Stimulation in Neuromuscular Disorders.**

PROFESSOR N. M. LIVENCEV, Leningrad University, Leningrad, U.S.S.R.

**SESSION ON MEDICAL PROBLEMS DIAGNOSED  
OR TREATED BY PHYSICAL MEDICINE**

*Morning*

**North Room**

Chairman — Thomas Gregg, Dublin, Ireland

Co-chairman — Nada Perkovic, Zagreb, Yugoslavia

**Referred Pain in the Lower Back, Left Perineum, Thigh and Leg Due to Diverticulosis or Irritability of the Sigmoid Colon. (*In English*)**

NINA KELLGREN, Physician in Charge, Physiotherapy Department, The Elizabeth Garrett Anderson Hospital, London, England.

**Acute Soft Tissue Calcinosis. (*In English*)**

SAMUEL G. FEUER, M.D., and O. FLIEGEL, M.D., Brooklyn, New York.

**Some Features of Rehabilitation of Quadriplegics and Paraplegics. (*In English*)**

DR. EMIL ADLER, and DR. CAROLINA ELIAKIM, Jerusalem, Israel.

**Effect of Ultrasonic Therapy to the Central Nervous System on the Level of Serotonine.**

DR. JOZEF JANKOWIAK, and DR. M. MAZUR, Instytut Balneoklimatyczny, Poznan, Poland.

**Rehabilitation of the Rheumatoid Hand by Surgical Means. (*In English*)**

EDWARD D. HENDERSON, M.D., and PAUL R. LIPSCOMB, M.D., Mayo Clinic, Rochester, Minnesota. *Introduced by Earl C. Elkins, M.D., Rochester, Minnesota.*

**SESSION ON SCOLIOSIS***Afternoon***Grand Ballroom**

Chairman — Gustave Gingras, Montreal, Quebec, Canada

Co-chairman — Ernesto Saldias G., Santiago, Chile

**Recognition and Care of Early Scoliosis. (In English)**

ROBERT L. BENNETT, M.D., Medical Director, Georgia Warm Springs Foundation, Warm Springs, Georgia.

**Changes in the Posture of School Children in Finland During the Present Century. (In English)**

DR. SAIMA TAWAST-RANCKEN, Helsinki, Finland.

**Intervertebral Joint Sprains. (In English)**

DR. ALAN STODDARD, London, England.

**Postural Factor in Paralytic Scoliosis: A Clinical, Radiological and Electromyographic Study. (In English)**

DR. KNUD JANSEN, Copenhagen, Denmark.

**Electromyographic Data in Idiopathic Scoliosis. (In English)**

DR. JACQUES LE FEBVRE; DR. ALLYRE TRIBOULET-CHASSEVANT, and DR. M. F. MISSIRLIU, Paris, France.

**Prolonged Scoliosis and Its Treatment with a Canvas-Cork Belt.***(In English and/or German)*

DR. RABAN VON CANSTEIN, Orthopadische Universitätsklinik, Köln-Lindenthal, West Germany.

**SESSION ON DISEASES OF SKELETAL MUSCLE***Afternoon***Colonial Room**

Chairman — Guillermo R. Damian, Quezon City, Commonwealth of the Philippines

Co-chairman — Carlos Hernandez Caballero, Barranquilla, Colombia

**Quantitative Muscle Testing: Principles and Applications to Research and Clinical Services. (In English)**

WILLIS C. BEASLEY, Ph.D., Bethesda, Maryland.

**Vegetative Reaktometrie Einer Erb'Schen Muskeldystrophie. (In German)**

DR. OTTO HAUSWIRTH, and PROFESSOR ING. FRANZ KRACMAR, Vienna, Austria.

**"Spreading Galvanic Response" (SGR) in Infranuclear Facial Paralysis.***(In English)*

DR. ASHER GHIORA, Head of Department of Physical Medicine and Rehabilitation, Workers' Sick Fund, Tel Aviv, Israel.

**Effects of Combined Denervation and Tenotomy on Skeletal Muscle.***(In English)*KHALIL G. WAKIM, M.D., Professor of Physiology, Mayo Clinic, Rochester, Minnesota. *Introduced by Frank H. Krusen, M.D., Rochester, Minnesota.***Some Observations on Bell's Palsy in Belfast During the Period 1949-1958.***(In English)*

DR. GEORGE GREGG, Belfast, Northern Ireland.

**Late Oedema after Muscular Exercise.**DR. PER BRENDSTRUP, Virum, Denmark. *Read by title.*



**Changes in Blood Flow, Oxygen Uptake and Tissue Temperatures Produced by the Topical Application of Wet Heat.**

DAVID I. ABRAMSON, M.D., Head, Department of Physical Medicine and Rehabilitation; ROSCOE E. MITCHELL, B.S.; SAMUEL TUCK, JR., B.S.; AGENOR M. ZAYAS, M.D.; YVONNE BELL, B.S., and WILLIAM L. CAMPBELL, B.S., University of Illinois College of Medicine, Chicago, Illinois.

**SESSION ON ARTHRITIS**

*Afternoon*

**North Room**

Chairman — Jose M. Poal, Barcelona, Spain

Co-chairman — Leon J. Michotte, Brussels, Belgium

**Relationship of Progress in Speech Therapy to Progress in Physical Therapy.**

DANIEL R. BOONE, Ph.D., Highland View Hospital, Cleveland, Ohio.

*Introduced by Mieczyslaw Peszczyński, M.D., Cleveland, Ohio.*

**Diagnosis, Treatment and Rehabilitation in Patients with Painful Shoulders.**

DR. CARLOS BUSTAMANTE R.; DR. GINO COSTA ELICE; DR. JORGE URDANIVIA DIAZ; TIRSO ORMENO ARDILES, P.T.; DINA ORNA, P.T.; JUANA CHAMORRO, P.T., and NORA RUIZ DIAZ, P.T., Lima, Peru.

**Local Injection of Corticosteroids in Musculoligamentous Injury. (In English)**

CHARLES S. WISE, M.D. and EUGENE LIPOW, M.D., Department of Physical Medicine and Rehabilitation, George Washington University Hospital, Washington, D. C.

**Cancer Arthritis and Rheumatoid Arthritis. (In English)**

DR. BRYNJULF STRANDBERG, and DR. NIELS V. JARLOV, Department of Physical Medicine, Rheumatism and Rehabilitation, Copenhagen County Hospital, Hellerup, Denmark.

**La Rehabilitation des Malades de Spondylite Ankylosante. (In French)**

DR. NADA PERKOVAC, Zagreb, Yugoslavia.

**The Use of Physical Therapy Modalities in the Treatment of Orthopedic and Neurologic Residuals in Hemophilia. (In English)**

ELIZABETH AUSTIN, M.D.; ELLIS W. JONES, M.D.; DONNA CLAUSEN, R.P.T.; MADELEINE FALLON, M.D.; SHELBY DIETRICH, M.D.; WARD ROLLAND, M.D.; SHIRLEY WHITEMAN, M.D., and ANDON A. ANDONIAN, M.D., Los Angeles, California.

**WEDNESDAY, AUGUST 24**

**SESSION ON NEUROMUSCULAR DISEASES**

*Morning*

**Grand Ballroom**

Chairman — Hans I. Weiser, Tel-Aviv, Israel

Co-chairman — Victor M. Santana Carlos, Lisbon, Portugal

**Mineral Metabolism Following Poliomyelitis. (In English)**

FRED PLUM, M.D., Division of Neurology, University of Washington School of Medicine, Seattle, Washington. *Introduced by Justus F. Lehmann, M.D., Seattle, Washington.*

**Etiology of Decubitus Ulcers: R. D. Grant Award.**

*To be announced.*

**Isometric Exercises in the Paraplegic and in the Patient with Weakness of Quadriceps and Hamstrings.**

JEROME W. GERSTEN, M.D., Professor and Head, Department of Physical Medicine and Rehabilitation, University of Colorado Medical Center, Denver, Colorado.

**Influence of Weight-Bearing and Muscle Contraction on Disuse Osteoporosis. (In English)**

ARTHUR S. ABRAMSON, M.D., and EDWARD F. DELAGI, M.D., Albert Einstein College of Medicine, New York, New York.

**Principles of Therapeutic Exercise in Motor Disturbances Following Cerebrovascular Disorders. (In French)**

PROFESSOR MICHAÏL ANIKIN, and G. R. TKACHEVA, Institute of Neurology, Academy of Medical Sciences, Moscow, U.S.S.R.

**Application of the Stretch and Hoffman Reflexes to the Objective Measurement of Spasticity.**

OSVALDO E. MIGLIETTA, M.D., and MILTON LOWENTHAL, M.D., New York Medical College, New York, New York.

**SESSION ON NEUROMUSCULAR DISEASES**

*Morning*

**Colonial Room**

Chairman — Otto Hauswirth, Vienna, Austria

Co-chairman — Italo Federico Goidanich, Bologna, Italy

**Rehabilitation of the Patient with Paraplegia Secondary to Spinal Neoplastic Metastasis.**

SAMUEL LEVINE, M.D., and VICTOR CUMMINGS, M.D., Montefiore Hospital, New York, New York.

**Rehabilitation Operation for 10,000 Moroccan Paralysis Victims. (In English)**

GUSTAVE GINGRAS, M.D., and M. H. L. DESMARAIS, M.D., Montreal, Quebec, Canada.

**Cervical Spondylosis As a Cause of Spinal Cord Pathology. (In English)**

BERNARD SANDLER, M.D., Minneapolis, Minnesota.

**Treatment of "Larva Migrans" by Ultrasonotherapy. (In English)**

WALDEMAR BIANCHI, M.D., Rio de Janeiro, Brazil.

**Diagnosis of Hysterical Paralysis. (In English)**

RALPH E. WORDEN, M.D., Los Angeles, California; ERNEST W. JOHNSON, M.D., and RICHARD D. BURK, M.D., Columbus, Ohio.

**SESSION ON BALNEOLOGY**

*Morning*

**North Room**

Chairman — Frantisek Lench, Prague, Czechoslovakia

Co-chairman — Jozef Jankowiak, Poznan, Poland

**Thalassotherapie et Reeducation Fonctionnelle. (In French)**

DR. MARCELLE D. PEILLON, Paris, France.

**Influence of Physical Agents on the Endocrine System. (In German)**

DR. ERWIN SCHLIEPHAKE, Giessen, West Germany.

**Therapy of Hypertension by a Gradually Warming Partial Bathing Apparatus. (In English)**

DR. TAKASHI SUGIYAMA, Miyagi-Ken, Japan.

**Significance of Rehabilitation in the Treatment of Chronic Pulmonary Emphysema. (In English)**

ALBERT HAAS, M.D., and ALEKSANDER LUCZAK, M.D., Bellevue Hospital, New York, New York. *Introduced by Donald A. Covatt, M.D., New York, New York.*

**Intensive Physical Medicine and Rehabilitation Therapy While "At Home" in a Hospital.**

KARL H. HAASE, M.D.; NORMAN A. ROSE, M.D.; MIGUEL J. RODRIGUEZ, M.D., and MURRAY LEVITTA, B.S., Physical Medicine and Rehabilitation Service, VA Center, Los Angeles, California.

## **THURSDAY, AUGUST 25**

### **SESSION ON PHYSIATRIC CARE FOLLOWING TRAUMA**

*Morning*

#### **Grand Ballroom**

Chairman — Gudmund Harlem, Oslo, Norway  
Co-chairman — Rene Waghemacker, Lille, France

**Rehabilitation of Quadriplegic Patients by the Use of Simple Mechanical Aids and Surgical Reconstruction of the Upper Extremities. (In English)**

EARL C. ELKINS, M.D.; PAUL R. LIPSCOMB, M.D., and EDWARD D. HENDERSON, M.D., Mayo Clinic, Rochester, Minnesota.

**Clinical Evaluation of a New Approach in the Treatment of Contracture Associated with Hip Fracture after Internal Fixation.**

JUSTUS F. LEHMANN, M.D.; WILBERT E. FORDYCE, Ph.D.; LOIS A. RATHBUN, B.S.; RUTH E. LARSON, B.S., and DOROTHY H. WOOD, B.S., Department of Physical Medicine and Rehabilitation, School of Medicine, University Hospital, Seattle, Washington.

**Immobilizing Efficiency of Cervical Braces.**

CHARLES M. GODFREY, M.D.; GORDON A. LAWSON, M.D., and K. E. HODGE, M.D., Sunnybrook Hospital, Toronto, Ontario, Canada.

**Comparison of the Bactericidal Effect of Visible Light with Ultraviolet Light on *Staphylococcus Aureus*.**

MICHAEL T. CARPENDALE, M.D., University of Alberta Hospital, Edmonton, Alberta, Canada.

**Postoperative Care in Lumbar Disc Syndrome.**

THOMAS P. ANDERSON, M.D.; ERNEST SACHS, JR., M.D.; ROBERT G. FISHER, M.D., and ROBERT M. KROUT, M.D., Hitchcock Clinic, Hanover, New Hampshire.

**Epidurography in the Diagnosis of Lumbar Disc Protrusions. (*In French*)**

DR. JEAN THIERRY-MIEG; S. JURMAND, and S. DE SEZE, Paris, France.

**SESSION ON NEUROMUSCULAR DISEASES**

*Morning*

**Colonial Room**

Chairman — Alfonso Tohen Z., Mexico D. F., Mexico  
Co-chairman — Frances Baker, San Mateo, California

**Functional Electrotherapy: Stimulation of the Peroneal Nerve Synchronized with the Swing Phase of the Gait of Hemiplegic Patients. (*In English*)**

W. T. LIBERSON, M.D.; HAROLD J. HOLMQUEST, E. E.; DAVID SCOTT, B.S., and MARGOT DOW, B.S., Physical Medicine and Rehabilitation Service, VA Hospital, Hines, Illinois.

**Peripheral Surgery in Hemiplegic Rehabilitation. (*In French*)**

WALTER J. TREANOR, M.D., San Francisco, California.

**Definitive and Functional Occupational Therapy in the Treatment of Hemiplegia. (*In English*)**

NILA KIRKPATRICK COVALT, M.D., Winter Park, Florida.

**A Six-Year Evaluation of Proprioceptive Neuromuscular Facilitation Technics. (*In English*)**

SEDGWICK MEAD, M.D., California Rehabilitation Center, Vallejo, California.

**Vertigo of Cervical Origin. (*In English*)**

H. I. WEISER, M.D., Tel-Aviv, Israel.

**SESSION ON MEDICAL PROBLEMS DIAGNOSED OR TREATED BY PHYSICAL MEDICINE**

*Morning*

**North Room**

Chairman — Herman J. Bearzy, Dayton, Ohio  
Co-chairman — Paul Vogler, Berlin, East Germany

**Respiratory Status and Metabolic Requirement, as Determined by Measurement of Carbon Dioxide Production.**

H. J. RALSTON, Ph.D.; GREGORY BARD, M.D., and CARRIE CHAPMAN, M.D., University of California Medical Center, San Francisco, California.

**Special Rehabilitation Services in Certain Cardiac and Pulmonary Disabilities.**

CHARLES D. SHIELDS, M.D., and MARGARET M. KENRICK, M.D., Department of Physical Medicine and Rehabilitation, Georgetown University Medical Center, Washington, D. C.

**Applications of Electromagnetic Fields in Medicine. A New and Valuable Method of Physical Therapy. (*In French*)**

PROFESSOR DR. TRAIAN DINCULESCU, Director, and DR. ARMAND MACELARIU, Chief of Medicine, Institute of Balneology and Physiotherapy, Bucharest, Roumania.

**Untersuchungen mit Elektroschlaf in der Inneren Medizin. (In German)**

DR. MED. SIEGFRIED KOEPPEN, and R. EICHLER, Wolfsburg, West Germany.

**Hypnosis, An Adjunct in the Treatment of Neuromuscular Disease. (In English)**

RICHARD F. BAER, M.D., Maumee, Ohio.

**SPECIAL SESSION**

*Afternoon*

**Grand Ballroom**

Chairman — Donald A. Covalt, New York, New York

Co-chairman — Mauritz Sisefsky, Stockholm, Sweden

**Clinical and Physiological Principles in the Physical Therapy of Neuromuscular Diseases.**

PROFESSOR ALEXANDER NICOAEVICH OBROSOV, Director of the State Institute of Balneology and Physiotherapy of the Public Health Ministry, Russian Soviet Federation of Socialist Republics; President of the Board of the All-Union Society of Physiotherapists and Balneologists of the U.S.S.R., and Chief Physiotherapist, Ministry of Health, Moscow, U.S.S.R.

**Panel Discussion: Role of Government in Rehabilitation.**

*Participants to be announced.*

**SESSION ON CEREBRAL PALSY**

*Afternoon*

**Colonial Room**

Chairman — Harold Cranfield, Oakville, Ontario, Canada

Co-chairman — Saima Tawast-Rancken, Helsinki, Finland

**Preliminary Report on the Facilities Provided for the Care of Cerebral Palsied Children in a Maritime City with a Population of 225,000 People. (In English)**

DR. A. KENNETH TYLER, Harting, Petersfield Hants, England.

**Study of Growth Patterns in Cerebral Palsy.**

JEROME S. TOBIS, M.D.; MILTON LOWENTHAL, M.D., and PHOEBE SATUREN, M.D., New York, New York.

**A Review of the Physiology, Measurement, and Management of Spasticity.**

JULIO P. ROASENDA, M.D., and PAUL M. ELLWOOD, JR., M.D., Elizabeth Kenny Institute, Minneapolis, Minnesota.

**The Nature of the Motor Deficit in Double Athetosis. (In English)**

THOMAS E. TWITCHELL, M.D., Joseph P. Kennedy, Jr. Memorial Hospital, Brighton, Massachusetts. *Introduced by Harold M. Sterling, M.D., Brighton, Massachusetts.*

**Second Year Review of Evaluating and Classifying the Vocational Potentials of the Cerebral Palsied. (In German)**

OTAKAR MACHEK, M.D., and HARDIN A. COLLINS, M.A., St. Louis, Missouri.

**Management of Emotional Barriers to Rehabilitation in Cerebral Palsied Adults.**

HUGH A. STORROW, M.D., and MARGARET H. JONES, M.D., Department of Psychiatry, University of California Medical Center, Los Angeles, California.  
*Introduced by Ralph E. Worden, M.D., Los Angeles, California.*

**SESSION ON MEDICAL PROBLEMS DIAGNOSED OR TREATED BY PHYSICAL MEDICINE**

*Afternoon*

**North Room**

Chairman — Robin Fordyce Hindley-Smith, Sao Paulo, Brazil

Co-chairman — Carlos Bustamante R., Lima, Peru

**Function of Home Evaluations in Discharging Rehabilitated Severely Disabled from the Hospital.**

MIECZYSLAW PESZCZYNSKI, M.D.; BETH H. FOWLES, B.S., and SUSAN P. MAHAN, O.T.R., Highland View Hospital, Cleveland, Ohio.

**Evaluation of Physical Disabilities by Means of Patient Profile Chart.**

O. LEONARD HUDDLESTON, M.D.; RICHARD W. MOORE, M.D., DAVID RUBIN, M.D.; THOMAS L. HUMPHREY, B.S., R.P.T.; JOHN CAMPBELL, B.S., and RON BLANCHETTE, Santa Monica, California.

**Value of Physical Medicine in a Children's Hospital. (In Spanish)**

ERNESTO SALDIAS G., M.D., Santiago, Chile.

**A Systematic Classification of the Chronic Sequelae of Poliomyelitis.**

CARLOS VALLBONA, M.D., and WILLIAM A. SPENCER, M.D., Texas Institute for Rehabilitation and Research, Houston, Texas.

**Application of Psychometrics in the Vocational Evaluation of the Adult Physically Disabled.**

DONALD SPANGLER; CHARLES W. THOMAS, and MIECZYSLAW PESZCZYNSKI, M.D., Highland View Hospital, Cleveland, Ohio.

**Medical and Social Outcome of 200 Respiratory and Former Respirator Patients on Home Care. (In English)**

GUNYON M. HARRISON, JR., M.D., and MAURINE B. MITCHELL, M.S.W., Texas Institute for Rehabilitation and Research, Houston, Texas.  
*Introduced by William A. Spencer, M.D., Houston, Texas.*

**Establishment of the Diagnosis and Judgment of the Effectiveness of the Treatment of Vertebral Blocks, by the Measurements of the Difference of Impedances of Certain Homologous Cutaneous Points on the Right and Left Extremities.**

DR. CHARLES VIDAL, Paris, France.



**FRIDAY, AUGUST 26****SESSION ON ORTHETICS AND PROSTHETICS***Morning***Grand Ballroom**

Chairman — Marcelle D. Peillon, Paris, France

Co-chairman — Donald J. Erickson, Rochester, Minnesota

**Biomechanical Considerations in the Rehabilitation of the Lower Extremity Amputee. (In English)**

FREDERICK E. VULTEE, M.D., Professor and Head, Department of Physical Medicine and Rehabilitation, Medical College of Virginia, Richmond, Virginia.

**A Modified Shoulder Saddle Harness for Upper Extremity Prostheses.**

LEONARD F. BENDER, M.D., and JAMES W. RAE, JR., M.D., Department of Physical Medicine and Rehabilitation, University of Michigan Hospital, Ann Arbor, Michigan.

**Role of Orthotics in Rehabilitation of Hands in Quadriplegia of Spinal Origin.**

ODON F. VON WERSOWETZ, M.D., Texas Rehabilitation Center, Gonzales, Texas.

**Functional Bracing of the Severely Paralyzed Upper Extremities.**

JOHN S. YOUNG, M.D.; BRUCE SCOTT, C.O.; VIRGINIA GORDON, O.T.R., and ELNORA GILFOYLE, O.T.R., Craig Rehabilitation Center, Denver, Colorado.

**The Tilt Table: A Restoration Unit.**

DUANE A. SCHRAM, M.D., Seattle, Washington.

**An Improved Socket Design for Above-Knee Prostheses.**

MILES H. ANDERSON, Ed.D., and JOHN J. BRAY, C. P. &amp; O., Prosthetics Education, U.C.L.A. Medical Center, Los Angeles, California.

**SESSION ON MEDICAL PROBLEMS DIAGNOSED OR TREATED BY PHYSICAL MEDICINE***Morning***Colonial Room**

Chairman — Basil Kiernander, Sussex, England

Co-chairman — Fevzi Gunalp, Istanbul, Turkey

**Use of Electronic Data Processing Technics in the Description and Evaluation of Disability: Preliminary Report. (In English)**

WILLIAM A. SPENCER, M.D., and CARLOS VALLBONA, M.D., Texas Institute for Rehabilitation and Research, Houston, Texas.

**Considerations sur les Principes, la Pratique et les Resultats de la Re-education Fonctionnelle Intrasanatoriale, Par la Therapeutique Occupationnelle et Qualificative, des Malades Porteurs d'Arthrites et Osteoarthritis Tuberculeuses.**

DR. NICOLAE HAIMOVICI-HANES, Bucharest, Roumania.

**Studies and Utilization of the Electrical Properties of Certain Cutaneous Points for Electrophysical Acupuncture. (In French)**

DR. PIERRE G. REGARD, Paris, France.

**Development of Objective Predictors of Recovery in Hemiplegic Patients.***(In English)*JAN H. BRUELL, Ph.D., and JERALD I. SIMON, B.A., Department of Physical Medicine and Rehabilitation, Highland View Hospital, Cleveland, Ohio.  
*Introduced by Mieczyslaw Peszczyński, M.D., Cleveland, Ohio.*

**A Decade in a Respiratory Center. (*In English*)**

ROBERT R. JACKSON, M.D.; WILLIAM A. SPENCER, M.D.; G. M. HARRISON, M.D.; L. K. SMITH, M.D.; M. B. MITCHELL, M.D., and K. E. WARE, M.D., Texas Institute for Rehabilitation and Research, Houston, Texas.

## SESSION ON MEDICAL PROBLEMS DIAGNOSED OR TREATED BY PHYSICAL MEDICINE

*Morning*

### North Room

Chairman — Emil Adler, Jerusalem, Israel

Co-chairman — to be announced

**Influence of Ultrasonics on the Suprapenes of Rabbits from the Histopathological Point of View.**

DR. CZESLAW MAJEWSKI, and DR. JOZEF JANKOWIAK, Poznan, Poland.

**Cervical Radiculitis: Diagnosis and Treatment. (*In English*)**

DAVID RUBIN, M.D., Los Angeles, California.

**Tuberculon Ostio-Articulaere et Reeducation Fonctionnelle. (*In French*)**

DR. JEAN DEBEYRE, and DR. GIRET, Paris, France.

**Special Appliances for the Disabled.**

ROY H. NYQUIST, M.D., Chief, Physical Medicine and Rehabilitation Section, VA Hospital, Long Beach, California.



## SCIENTIFIC EXHIBITS

Scientific exhibits will be on display during the week of TERPHYSMED. These exhibits will be open to viewing through 12:00 noon on Thursday, August 25, 1960. Medals will be awarded to those exhibits which are adjudged outstanding by the Committee on Awards and Prizes. The awards will be announced and presented at the dinner. Abstract of exhibit content will be published in the final TERPHYSMED program.

**Physiologic Evaluation of Therapeutic Physical Agents.**

David I. Abramson, M.D.; Yvonne Bell, B.S.; Samuel Tuck, Jr., B.S., and Roscoe Mitchell, B.S. *Chicago, Illinois.*

**St. Thomas' Hospital (London) Electromyograph Mk III.**

Philippe Bauwens, M.D. *London, England.*

**Quantitative Clinical Muscle Testing.**

Willis C. Beasley, Ph.D. *Bethesda, Maryland.*

**Progressive Muscular Dystrophy.**

J. Morrison Brady, M.D., Muscular Dystrophy Associations of America, Inc. *New York, New York.*

**Ocular Findings in Cerebral Palsy.**

Arnold S. Breakey, M.D. *New York, New York.*

**Rehabilitation of Hip Fracture.**

Michael M. Dacso, M.D., and Masayoshi Itoh, M.D. *New York, New York.*

**Strike Back at Arthritis.**

Bernard D. Daitz, M.D.; David M. Fried, M.D.; Wilfred D. David, M.D., and Joseph J. Bunim, M.D. *Washington, D. C., and Ronald W. Lamont-Havers, M.D., The Arthritis and Rheumatism Foundation, New York, New York.*

**Philately in Rehabilitation.**

Lewis Dickar, M.D. *New York, New York.*

**Anatomical Localization of Common Vascular Brain Syndromes.**

Alfred Ebel, M.D. *Bronx, New York.*

**Hypotonia in Infancy.**

Paul M. Ellwood, Jr., M.D. *Minneapolis, Minnesota.*

**A Study of the Relationship between the Severity of Paralysis in Poliomyelitis and the Shortening of Lower Limbs.**

Dr. Rafael Esteve-De-Miguel. *Barcelona, Spain.*

**Clinical Prosthetics.**

Harold W. Glatly, M.D. *Washington, D. C.*

**Experimental Designs in Functional Upper Extremity Orthotics.**

Thorkild J. Engen, C.O., and Paul R. Harrington, M.D. *Houston, Texas.*

**The History of the Medical Department, U. S. Army in World War II.**

Lt. General L. D. Heaton. *Washington, D. C.*

**Surgical Treatment of Rheumatoid Arthritis of the Hand.**

E. D. Henderson, M.D.; P. R. Lipscomb; H. F. Polley, and R. H. Ferguson.  
*Rochester, Minnesota.*

**Patient Profile Chart: Evaluation of Physical Disability.**

O. Leonard Huddleston, M.D., Ph.D., and John W. Campbell, B.S., O.T.R.  
*Santa Monica, California.*

**Diagnosis of "Hysterical Paralysis".**

Ernest W. Johnson, M.D.; Ralph E. Worden, M.D., and Richard D. Burk, M.D.  
*Columbus, Ohio.*

**Bed End Tilt Table.**

Adrian C. Kanaar, M.D. *Buffalo, New York.*

**Clinical and Therapeutic Aspects of Muscular Dystrophy.**

Margaret M. Kenrick, M.D.; Desmond S. O'Doherty, and Joseph K. Perloff.  
*Washington, D. C.*

**Breathing Exercises for Asthma and Emphysema.**

Herbert Kent, M.D. *Oklahoma City, Oklahoma.*

**Rehabilitation of the Long-Term Chronic Patient in the Veterans Administration.**

A. B. C. Knudson, M.D., and Frank H. Schaffer, M.D. *Washington, D. C.*

**Which Rheumatic Disease?**

Kenneth M. Kron, M.D.; Irvin F. Hermann, M.D.; Richard T. Smith, M.D.; John C. Richards, M.D., and William P. Peak, M.D. *Philadelphia, Pennsylvania.*

**Electrophysiological Brace for Foot Drop in Hemiplegics.**

W. T. Liberson, M.D., Ph.D., and H. J. Holmquest, E.E. *Hines, Illinois.*

**Surgical Rehabilitation of the Arthritic Hand.**

W. D. Paul, M.D. *Iowa City, Iowa.*

**Some New and Experimental Adapted Equipment (Live Display).**

Mieczyslaw Peszczyński, M.D.; Gladys Brett, O.T.R., and Vincent Masciarelli.  
*Cleveland, Ohio.*

**The Prevention and Correction of Deformity with Splints.**

J. Norrie Swanson, M.D. *Toronto, Ontario, Canada.*

**EMG Laboratory, Pathologic and Clinical Correlation in Poliomyelitis.**

William C. Schaefer, M.D.; C. E. Rupe, M.D.; Robert E. Birk, M.D., and Joseph C. Sieracki, M.D. *Detroit, Michigan.*

**Hypercortisolemia in Patients with Rheumatoid Arthritis.**

C. H. Slocumb, M.D.; H. F. Polley, M.D.; L. E. Ward, M.D., and J. G. Mayne, M.D.  
*Rochester, Minnesota.*

**Demonstration by Blind Physiotherapist.**

Dr. Clive Shields. *London, England.*

**Oscillemetric Arterial Circulatory Norms.**

Bror S. Troedsson, M.D. *Minneapolis, Minnesota.*

**Stimulation Assistive Exercises (SAE) in Hemiplegia.**

Harry T. Zankel, M.D. *Durham, North Carolina.*



## SCIENTIFIC FILMS

Scientific films will be shown during the entire week of the session. The final program will carry the daily and hourly schedule of films. For the convenience of those attending TERPHYSMED, there will be evening film programs during which time repeat showing of films scheduled during the day will be made. Abstract of film content will be published in the final TERPHYSMED program.

**Rehabilitation Techniques in the Treatment of Hemiplegia.**

*Color, sound, 30 minutes; commentary in English.*

Presented by Gordon A. Lawson, M.D., and Charles Godfrey, M.D., Toronto, Ontario, Canada.

**New Aids for the Handicapped: Appliance Research in Saskatchewan.**

*Color, sound, 20 minutes; commentary in English.*

Presented by Adrian C. Kanaar, M.D., Buffalo, New York.

**Peripheral Surgery in Hemiplegic Rehabilitation.**

*Color, sound, 20 minutes; commentary in English.*

Presented by Walter J. Treanor, M.D., San Francisco, California.

**Neurophysiologic Influences in the Restoration of Function of the Upper Extremity in Adult Hemiplegic Patients.**

*Black and white, sound, 35 minutes; commentary in English.*

Presented by Glenn G. Reynolds, M.D., Takoma Park, Maryland and Signe Brunnstrom, M.A., New York, New York.

**Principes Generaux de la Gymnastique des Scolioses.**

*Color, sound, 30 minutes; commentary in English and French.*

Presented by Dr. Allyre Triboulet-Chassevant, Paris, France.

**The Independent Quadriplegic.**

*Color, silent, 30 minutes; commentary in English.*

Presented by Florence I. Mahoney, M.D., and Kathleen Dixon, R.P.T. Baltimore, Maryland.

**Hysterical Gait.**

*Color, sound, 20 minutes; commentary in English.*

Presented by Ralph E. Worden, M.D., Los Angeles, California.

**Prested Hall, A Centre for Adult Spastics.**

*Color, silent, 30 minutes; commentary in English.*

Presented by Dr. Kenneth W. N. Palmer, Colchester, England.

**Automatic Chair Bed.**

*Color, sound, 10 minutes; commentary in English.*

Presented by Francis J. Sullivan, M.D., Long Beach, California.

**Neurological Examination of Infants.**

*Color, sound, 25 minutes; commentary in English.*

Presented by Paul M. Ellwood, Jr., M.D., Minneapolis, Minnesota.

**Rehabilitation of a Post-Hemispherectomy Case.**

*Black and White, silent, 35 minutes; commentary in English.*

Presented by Joshua Ehrlich, M.D., Albany, New York.

**Cinefluorography of the Cervical Spine Before, During and After Cervical Traction.**

*Black and white, silent, 5 minutes; commentary in English.*

Presented by Albertus Wildervanck, M.D., and J. Feddema, Eindhoven, Netherlands.

**Tuberculon Ostio-Articulare et Readuction Fonctionelle.**

*Black and white, silent, 15 minutes; commentary in French.*

Presented by Dr. Jean Debeyre, Paris, France.

**Rehabilitation Adds Life to Years.**

*Color, sound, 30 minutes; commentary in English.*

Presented by American Medical Association, Committee on Rehabilitation, Frank H. Krusen, M.D., Chairman, Chicago, Illinois.

**Wheelchair Devices and Wheelchair Modifications to Aid Propulsion.**

*Color, silent, 20 minutes; commentary in English.*

Presented by O. Leonard Huddleston, M.D., Ph.D., and John W. Campbell, B.S., O.T.R., Santa Monica, California.

**Able to Live Again — Rehabilitation of a C-5 Quadriplegic Patient.**

*Color, sound, 55 minutes; commentary in English.*

Presented by Mieczyslaw Peszczyński, M.D.; Beth H. Fowles, and T. Warren Strauss, Cleveland, Ohio.

**Marche Normale et Marche Pathologique.**

*Color, sound, 90 minutes; commentary in French.*

Presented by Dr. Robert Ducroquet; Dr. Jean Ducroquet; Dr. Pierre Ducroquet, and Marcel Bienfait, Paris, France.

**Scoliosis — Spine Instrumentation for Correction of Scoliosis.**

*Color, sound, 25 minutes; commentary in English.*

Presented by Paul R. Harrington, M.D., Houston, Texas.

**Tratamiento y Rehabilitación en un Caso de Amputación Congénita de Miembros.**

*Color, 15 minutes; commentary in Spanish.*

Presented by Dr. Gino Costa Elice; Dr. Carlos Bustamante R.; Dr. J. Urdanivia; Tirso Ormeno, and Dina Orna, Lima, Peru.

**How to Breathe Better.**

*Color, sound, 20 minutes; commentary in English.*

Presented by Herbert Kent, M.D., Oklahoma City, Oklahoma.

**Pearl-chain Formation in Short Wave Fields in Emulsions, Diluted Blood and Undiluted Lymph.**

*Black and white, silent, 5 minutes; commentary in English.*

Presented by Albertus Wildervanck, M.D., Eindhoven, Netherlands.

**Total Rehabilitation of a Bilateral Upper Extremity Amputee.***Color, sound, 35 minutes; commentary in English.*

Presented by Bror S. Troedsson, M.D., Minneapolis, Minnesota.

**Assisted Self-Help for Children with Severe Cerebral Palsy.***Black and white, silent, 15 minutes; commentary in English and French.*

Presented by Harold M. Sterling, M.D., Brighton, Massachusetts.

**Rehabilitation Operation for 10,000 Moroccan Paralysis Victims.***Black and white, sound, 20 minutes; commentary in English.*

Presented by Gustave Gingras, M.D., Montreal, Quebec, Canada.

**TECHNICAL EXHIBITS****AMERICAN WHEEL CHAIR DIVISION — Booth 60**

AMERICAN WHEEL CHAIR DIVISION will have on display representative models of its complete line of quality wheel chairs, walkers, get-about chairs, and commodes. The AMERICAN line includes wheel chairs with removable arms, interchangeable footrests and legrests, reclining backs, headrests, arm slings—and new developments in rehabilitation equipment.

**THE JOHN BUNN CORP. — Booth 56**

Bunn will show the new Franklin Hospital Bed which attains any position from Trendelenburg to vertical and a true cardiac position. Designed for paraplegic, polio, paralyzed patients with added cardiac patient benefits. New Bunn Air Pulsating Pad will be shown—heals and prevents decubitus ulcers.

**THE BURDICK CORP. — Booths 48 and 49**

The Burdick Corporation will display in booths 48 and 49 representative items of their line of Physical Medicine Equipment. These include Ultrasonic (continuous and pulsed), Conventional Short Wave, Microwave Diathermy and Electrical Stimulating Equipment. Of special interest will be the new MS-600 Muscle Stimulator, a compact and versatile generator of faradic type and unidirectional currents.

**S. H. CAMP & COMPANY—Booth 39**

New Camp products on display include the Camp Cervi-brace, Camp-Cullen Ankle Brace and the Taylor Brace Insert. "Medic" Full-fashioned Elastic Stockings plus supports of new and improved design. Patients will appreciate the quality, comfort and low cost. All of these new items are immediately available at your local Camp Authorized Dealers.

**CHATTANOOGA PHARMACEUTICAL CO., INC. — Booths 21 and 22**

Again, we extend our cordial invitation to visit our booth. If you are already using the Hydrocollator, we will be anxious to talk to you, help you with any problems, and thank you for your continued use of our products. If you are not already using the Hydrocollator, do stop by for a demonstration. Feel for yourself the intense, soothing moist heat of this application, see its simplicity and convenience, and learn the many advantages of the Hydrocollator in your work.

**THE COCA-COLA CO. — Booths 23 and 24**

Ice-cold Coca-Cola served through the courtesy and co-operation of the Washington Coca-Cola Bottling Company, Incorporated, and The Coca-Cola Company.

**THE CONFERENCE BOOK SERVICE — Booth 11**

The Conference Book Service will be displaying books of special and particular interest to the conferees and delegates attending the Congress. The books which will be on display will be from the lists of the important publishers.

**COSMO MFG. CO. — Booth 54**

(Division of Cosmo Surgical & Orthopedic Corp.)

**DALLONS LABORATORIES, INC. — Booth 37**

Dallons Laboratories, Inc. will exhibit the Futura lines of advanced design and advanced engineering apparatus for Physical Medicine. Never before has there been a more attractive line offered to the Profession. We invite your careful inspection and comparison. You will quickly see why doctors everywhere are acclaiming the Dallons Futura line as "the instruments of choice."

**THE DEVEREUX FOUNDATION — Booth 38**

Devereux Schools, Devon, Pennsylvania; Santa Barbara, California; and Victoria, Texas provide complete facilities for the education and training of exceptional children who are unable to adjust in the usual public and private school. Consultations with resident psychiatrist, medical and psychological personnel and referring physician, when indicated. Children are placed according to age, academic level and problem presented.

**DRIVE-MASTER CORPORATION — Booths 63 and 64**

A simplified, highly efficient device that enables one to drive a car with their hands. Manufactured by the Handicapped of stainless steel and aircraft aluminum. It is easily installed, won't mar the car, nor interfere with normal operation. Anyone strong enough to steer a car can drive it with a Drive-Master Control.

**DYNA-WAVE CORPORATION — Booth 62**

DynaWave is designed to furnish safe, high intensity, monopolar electric pulses, and to discharge them through areas under treatment by means of a movable (active), and a fixed (dispersive) electrode. It embodies properties that induce maximum subcutaneous stimulation with minimum sensory disturbance. Voltage adjustable from zero to 450.

**ELGIN EXERCISE APPLIANCE CO. — Booth 45**

The originators and manufacturers of PROGRESSIVE RESISTANCE EXERCISE EQUIPMENT again provide you with the latest designed equipment. INTRODUCING AN ENTIRELY NEW EXERCISE UNIT. The NEW ELGIN EXERCISE CHAIR is ideal for the physiatrist's office, clinic, or physical therapy department. Requires a minimum amount of space. Excellent for resistive, assistive, or reciprocal motion exercises. Used in hospitals, physical medicine and rehabilitation centers throughout the world, the COMPLETE ELGIN EXERCISE UNIT—MODEL A-1500 is again on display for your inspection. All ELGIN ACCESSORIES and other new products to be exhibited in BOOTH No. 45.

**EVEREST & JENNINGS, INC. — Booths 35 and 36**

Be sure to see the Everest & Jennings Mono-Drive Attachment. This new power attachment can easily be attached to most Everest & Jennings chairs presently in use. With this power equipment the patient's ability to move about freely is greatly increased. Be sure to pick up your free notebook and pencil at the Everest & Jennings booth. Manning the booth will be Mr. Harry Dunn and Mr. Mike Murray.

**R. A. FISCHER & CO. — Booth 55**

Visit Booth 55 to see Fischer's new, improved 1960 modeled electro-physical equipment. Among the many modalities available with Fischer apparatus are ultrasonic surging, continuous and impulse techniques. Ask their representative to demonstrate the Fischertherm, Fischerquartz, Fischersine and Fischer Ultrasound.

**FLORIDA BRACE CORP. — Booth 61**

FLORIDA BRACE CORPORATION, Winter Park, Florida, will exhibit THE JEWETT HYPEREXTENSION BRACE, Standard and Fusion Models, for treatment of spinal conditions requiring positive hyperextension such as simple compression fractures, osteoporosis, Marie Struempell's Disease, etc.; cervical attachments for incorporation with this brace for high dorsal and cervical injuries; also various types of light weight adjustable cervical collars, for extension, flexion or stabilization.

**GERIATRIC PHARMACEUTICAL CORP. — Booth 16**

Geriatric Pharmaceutical Corporation will exhibit GER-O-FOAM, an anesthetic analgesic which, when massaged into muscular-skeletal involvements, will relieve pain in minutes and last for hours. A sample and a copy of the original article by Drs. Edward Gordon and Albert Hays will be available at the booth.

**J. E. HANGER, INC. — Booth 44**

Modern prosthetic devices for upper and lower extremity amputees will be displayed by the Hanger organization who offer a complete service to the amputee. A representative will show you the Hanger Suction Socket Limb and the recent improvements for upper extremity prostheses.

**W. R. HAUSMANN WOODWORK, INC. — Booth 33A**

W. R. Hausmann Woodwork, Inc. will again display their fine line of precision crafted physical therapy equipment.



There will be many of the company's new patient aid devices available for your inspection. Mr. Hausmann and Mr. Kratt will be on hand to greet you and discuss any phases of this new equipment, so stop by and say hello.

#### HILL LABORATORIES CO. — Booth 8

Hill Traction Table for intermittent or steady traction will be demonstrated. Traction may be applied to the cervical, low back, ankles or single ankle. The pull may be regulated from 0 to 200 lbs. This traction table also features the cushioned semi-pneumatic rollers for applying rolling traction at the same time as the stretching traction. Heat and vibration are optional.

Mobile Hill Applicator for controlled moist or dry heat applied over specific areas or over the entire body.

#### ILLE ELECTRIC CORP. — Booths 18 and 19

HYDROMASSAGE SUBAQUA THERAPY EQUIPMENT. Ille Electric Corporation welcomes you to Booth Nos. 18 and 19 to see the latest available units for the after-care treatment of polio, fractures, and many disabling conditions. They will display a Full Body Immersion Tank, Whirlpool Bath, Paraffin Bath and Moisture Heat Therapy Unit.

#### THE JOBST INSTITUTE, INC. — Booth 51

The Jobst Intermittent Compression Unit with pneumatic appliances used to successfully reduce edema of the extremities due to poor circulation, lymphatic problems, injuries, and postoperative conditions. Jobst pressure gradient elastic supports for arm, to the knee, to above the knee, or to the torso. These supports are a functional device that create a physiological change in fluid dynamics of the extremities. They are used to combat peripheral vascular problems, recurrence of edema, and leg infections due to stasis.

#### KESSLER ASSOCIATES, INC. — Booth 12

A comprehensive prosthetic presentation representing advanced techniques, products of latest research and development to be presented and demonstrated. Completed concepts of modern materials and application to newly developed prostheses are displayed and explained by Certified Prosthetists who will be in attendance. Questions regarding prosthesis in general will be welcomed.

#### LA BERNE MFG. CO., INC. — Booth 57

LaBERNE will exhibit:

1. A new portable Ankle Exerciser, with controlled resistance for eversion, inversion, dorsiflexion, and plantar-flexion exercise.
2. A new Pronator-Supinator, offering selected pronation or selected supination, with controlled resistance for either.
3. The LaBERNE Extension-Flexion Exercise Unit, offering controlled calibrated resistance to the knee muscle group.
4. The LaBERNE Shoulder Rotator, for internal and external rotations.
5. The LaBERNE Hip-Rotator.

#### ELIZABETH LICHT, PUBLISHER — Booth 33

Display of PHYSICAL MEDICINE LIBRARY books. Volume One—Electrodiagnosis and Electromyography; Volume Two—Therapeutic Heat; Volume Three—Therapeutic Exercise; Volume Four—Therapeutic Electricity and Ultraviolet Radiation; Volume Five—Massage, Manipulation and Traction; Volume Six—World Directory of Physical Medicine Specialists (sole limited to physicians).

#### R. J. LINDQUIST CO. — Booth 53

The following items manufactured by R. J. Lindquist Company will be demonstrated in Booth 53:

1. Chronosonic Ultrasound, with interchangeable multiple crystal stationary, moving, and orificial soundheads.
2. Chronosonic Stimulator, for all low-voltage therapy.
3. Model "S" Stimulator for combination therapy with ultrasound applicators.
4. Portable Short Wave Diathermy.
5. Chronaximeter.
6. "Desert Sun" Therapy Lamps.

#### MARKELL SHOE CO., INC. — Booth 15

Tarso Supinator, Tarso Pronator and Tarso Medius prescription shoes for children will be displayed—also a complete assortment of night splints. Tarso Shoes have applications in after treatment and rehabilitation of polio, cerebral palsy, and talipes. Individual fittings for each foot are routine. Efficient factory stock department and national dealer distribution make it convenient to prescribe Tarso Shoes almost anywhere. Tarso Shoes have been in use for over twenty-five years.

#### MEDCO PRODUCTS CO. — Booth 2

Presenting the MEDCO-SONLATOR. Providing a new concept in therapy by combining muscle stimulation and ultrasound simultaneously through a SINGLE Three-Way Sound Applicator. The MEDCO-SONLATOR is a distinct

advance in the effectiveness of physical therapy in your office or hospital. A few minutes spent in our booth should prove of value to your practice.

#### THE MEDITRON CO. — Booth 32

A member of the Meditron Company's medical consultant staff will be happy to answer your questions at our Booth No. 32 or in Meditron's hospitality room in the hotel. See Meditron's new modernized ELECTROMYOGRAPHS and NERVE CONDUCTION VELOCITY instrumentation.

#### MIDWEST IMPORTS — Booths 45 and 46

The Physical Medicine Division of Midwest Imports, Hinsdale, Illinois, exhibits the SIEMENS PHYSICAL MEDICINE line, appreciated in 12 countries; a complete line of low volt generators, a thermal cabinet and diagnostic instruments. See the SIEMENS ULTRATHERM and ISO-THERM super-automatic diathermy machines with automatic tuner SERVOMAT.

#### OTARION LISTENER CORP. — Booth 52

Otarion Listener Corporation demonstrates the advantages of Direct Frontal Hearing—achieved by a minute microphone in front frame of eyeglasses. On display by the manufacturers of the original hearing aid built into eyeglasses is a complete line of Listener eyeglass hearing aids, including bilateral, binaural, bone conduction, single temple and telephone amplifier types. Other features are tiny at-the-ear instruments and conventional aids. Demonstrations of the "one unit" combination puretone and speech audiometer will be given.

#### J. A. PRESTON CORPORATION — Booths 46 and 47

Welcome to our friends from everywhere. For your visit, we are exhibiting some interesting new developments from our Complete Line: DIAGNOSTIC APPARATUS featuring a new Skin Temperature Unit; Exercise Apparatus; Electro-Medical Equipment; Selected BOOKS. For your information on all items, register for your free copy of the ALL-NEW PRESTON CATALOG No. 1065—over 200 pages, 1057 illustrations—the MOST COMPLETE Catalog in the Field. Preston's International Sales Division supplies equipment throughout the world.

#### REHABILITATION PRODUCTS — Booths 40 and 41

(Division of American Hospital Supply Corp.)

Selected products of Physical Medicine and Rehabilitation Equipment: New Washex Automatic Toilet Seat, Circ-Olectric Bed, Tomac All-Purpose Table, Circulator, Tomac Snap-ON Covers for Hydrocollator Packs, Miller Twister, Tomac Electro-Therapy Equipment, Invalid Walkers, American Wheel Chairs, Traction Devices, Exercise Equipment and Self-Help Devices. Register for the new R/P Products Bulletin. Our Staff of specialists—our 125 sales representatives—our 12 regional offices are all eager to serve you.

#### SAFETY BATH, INC. — Booth 9

Safety Bath makes it possible for the physically handicapped to bathe themselves with perfect safety. Wrap-around shower head affords maximum body coverage. Flexible spray head available to wash hair, face, etc. Adjustable seat with hydraulic controls make entry from wheelchair easy.

#### TECA CORP. — Booth 1

SEE TECA for the latest in electrodiagnosis and electrotherapy. Low volt generators, ultrasound, chronaximetry and new Tecca electromyograph will be in operation. New photo recording and conduction time testing features will be shown. Bring your questions.

#### THERMO-ELECTRIC CO. — Booth 10

The Dickson Paraffin Baths were designed and developed in cooperation with Cleveland Hospitals where they have been in constant use for twenty years. All models are equipped with a drain for easy cleaning. The mahogany moulding around the top of the Bath affords comfort for the patients. Truss construction permits easy handling of the Baths. Two models will be shown.

#### TRU-EZE MFG. CO., INC. — Booth 20

See our demonstration on the TRACTOMATIC portable intermittent traction machine. Adaptable to vertical cervical traction or horizontal cervical and lumbar traction. Simplicity of operation permits you to see other patients while treatment is in effect. As an added feature we will be showing the NEW "TRU-TRAC" RT-99 Traction and Therapy Table. Ideal for horizontal traction. Split in two sections: lumbar section operates on ball-bearing rollers, cervical traction at any angle up to 45 degrees. For the professional preferring vertical cervical traction or with limited office space, the "TRU-TRAC" Flexion Traction Chair. Traction at any angle up to 45 degrees. Provides definite flexions while supporting the low-back. Also see our many improvements on economical traction sets for home use, supplementing office treatment and aiding in earlier hospital release.





## LIST OF EXHIBITORS

## - A -

American Wheel Chair Division—Institutional Industries, Inc.  
5500 Muddy Creek Rd., Cincinnati 38, Ohio

## - B -

The John Bunn Corporation  
163 Ashland Ave., Buffalo 22, N. Y.  
The Burdick Corporation  
Milton, Wis.

## - C -

S. H. Camp and Company  
109 W. Washington, Jackson, Mich.  
Chattanooga Pharmacal Co., Inc.  
2400 Dayton Blvd., Chattanooga, Tenn.  
The Coca-Cola Company  
P.O. Drawer 1734, Atlanta 1, Ga.  
The Conference Book Service  
201 S. Washington St., Alexandria, Va.  
Cosmo Manufacturing Company—  
Division of Cosmevo Surgical & Orthopedic Corp.  
236 River St., Hackensack, N. J.

## - D -

The Devereux Foundation  
Devon, Pa.  
Drive-Master Corporation  
181-A Valley Rd., Montclair, N. J.  
Dyna-Wave Corporation  
P.O. Box 96, Staunton, Va.

## - E -

Elgin Exercise Appliance Company  
P.O. Box 132, Elgin, Ill.  
Everest & Jennings, Inc.  
1803 Pontius Ave., Los Angeles 25, Calif.

## - F -

R. A. Fischer & Company  
517 Commercial St., Glendale, Calif.  
Florida Brace Corporation  
601 Webster Ave., Winter Park, Fla.

## - G -

Geriatric Pharmaceutical Corporation  
45 Commonwealth Blvd., Bellerose, L.I., N. Y.  
The R. D. Grant Company  
761 Hippodrome Bldg., Cleveland 15, Ohio

## - H -

J. E. Hanger, Inc.  
221 G St., N.W., Washington 13, D.C.  
W. R. Hausmann Woodwork, Inc.  
1545-47 Inwood Ave., New York 52, N. Y.  
Hill Laboratories Company  
445 Lincoln Highway, Malvern, Pa.

## - I -

Ile Electric Corporation  
Reach Rd., Williamsport, Pa.

## - J -

The Jobst Institute, Inc.  
P.O. Box 653, Toledo 1, Ohio

## - K -

Kessler Associates, Inc.  
166 Clinton Ave., Newark, N. J.

## - L -

La Berne Manufacturing Company, Inc.  
819 Leesburg Rd., P.O. Box 5245, Columbia, S. C.  
Elizabeth Licht, Publisher  
560 Fountain St., New Haven 15, Conn.  
R. J. Lindquist Company  
2419 West 9th St., Los Angeles 6, Calif.

## - M -

Markell Shoe Company, Inc.  
332 S. Broadway, Yonkers, N. Y.  
Medco Products Company  
3601 E. Admiral Pl., Tulsa, Okla.  
The Meditron Company  
708 S. Fair Oaks, Pasadena, Calif.  
Midwest Imports  
Physical Medicine Division, Hinsdale, Ill.

## - O -

Otarion Listener Corporation  
P.O. Box 711, Ossining, N. Y.

## - P -

J. A. Preston Corporation  
175 Fifth Ave., New York 10, N. Y.

## - R -

Rehabilitation Products—  
Division of American Hospital Supply Corporation  
2029 Ridge Ave., Evanston, Ill.

## - S -

Safety Bath, Inc.  
P.O. Box 781, Lubbock, Texas

## - T -

Teen Corporation  
80 Main St., White Plains, N. Y.  
Thermo-Electric Company  
2372 West 7th St., Cleveland 13, Ohio  
Tru-Eze Manufacturing Company, Inc.  
436 Bethany Rd., Burbank, Calif.



**3rd INTERNATIONAL CONGRESS OF PHYSICAL MEDICINE***Preliminary Schedule of Daily Activities*

(The 38th annual session of the American Congress of Physical Medicine and Rehabilitation and the 22nd assembly of the American Academy of Physical Medicine and Rehabilitation *business sessions only* will be held during the international conference.)

**Friday, August 19**

- 9:00 Meeting: Editorial Board, Archives of Physical Medicine and Rehabilitation — Concord Room  
Noon Luncheon: Editorial Board, Archives of Physical Medicine and Rehabilitation — Potomac Room

**Saturday, August 20**

- 8:00 Meeting: Board of Governors, American Congress of Physical Medicine and Rehabilitation — Concord Room  
2:00 Registration — Grand Ballroom Promenade

**Sunday, August 21**

- 8:00 Meeting: Board of Governors, American Congress of Physical Medicine and Rehabilitation — Concord Room  
8:00 Breakfast Meeting: Board of Governors, American Academy of Physical Medicine and Rehabilitation — Potomac Room  
10:00 Coffee Hour: Hostesses, Woman's Auxiliary, American Congress of Physical Medicine and Rehabilitation — Pan American Room  
10:00 Registration — Grand Ballroom Promenade  
Noon Luncheon — At leisure  
1:30 Meeting: Executive Committee, International Federation of Physical Medicine — Concord Room  
2:00 Annual business meeting: American Academy of Physical Medicine and Rehabilitation (members only) — Grand Ballroom: *current AAPM&R membership card must be presented for admittance to this session*  
3:00 Meeting: Delegates, International Federation of Physical Medicine — Colonial Room  
7:00 Reception and Dinner: Delegates, International Federation of Physical Medicine — Colonial Room (*Evening Dress*)

**Monday, August 22**

- 8:00 Registration — Grand Ballroom Promenade — Inspection of Exhibits  
10:00 Formal Opening Ceremony: Departmental Auditorium, Constitution Avenue between 12th and 14th Street, N.W. Participating Service Unit: United States Marine Corps Band.  
Noon Luncheon — Inspection of Exhibits  
2:30 Plenary Session: 3rd International Congress of Physical Medicine — Grand Ballroom  
4:00 Scientific Session: 3rd International Congress of Physical Medicine — Colonial Room

- 4:00 Scientific Session: 3rd International Congress of Physical Medicine  
— North Room  
Scientific films (continuous showing) — Jefferson Room
- 6:00 Senatorial Reception by Senator Eugene J. McCarthy of Minnesota;  
to Senate Caucus Room, Old Senate Office Building (*Dress Optional*)
- 8:00
- 9:00 Private Viewing of the Collections, National Gallery of Art;  
to Music by Teva Gordey and the Silver Strings (*Dress Optional*)
- 11:00

### Tuesday, August 23

- 8:00 Registration — Grand Ballroom Promenade — Inspection of Exhibits
- 8:00 American Treat Breakfast — Colonial Room
- 10:00 Plenary Session: 3rd International Congress of Physical Medicine  
— Grand Ballroom
- 10:50 Scientific Session: 3rd International Congress of Physical Medicine  
— Colonial Room
- 10:50 Scientific Session: 3rd International Congress of Physical Medicine  
— North Room  
Scientific films (continuous showing) — Jefferson Room
- 10:00 Tour of Washington, D. C.: Hostesses, Woman's Auxiliary, American Congress  
of Physical Medicine and Rehabilitation
- 10:00 Coffee Hour: Hostesses, Woman's Auxiliary, American Congress of Physical  
Medicine and Rehabilitation — Pan American Room
- Noon Luncheon — Inspection of Exhibits
- 2:00 Plenary Session: 3rd International Congress of Physical Medicine  
— Grand Ballroom
- 2:50 Scientific Session: 3rd International Congress of Physical Medicine  
— Colonial Room
- 2:50 Scientific Session: 3rd International Congress of Physical Medicine  
— North Room  
Scientific films (continuous showing) — Jefferson Room
- 8:00 Baseball Game: Washington Senators vs. Kansas City Athletics, Griffith Stadium

### Wednesday, August 24

- 8:00 Registration — Grand Ballroom Promenade — Inspection of Exhibits
- 9:00 Plenary Session: 3rd International Congress of Physical Medicine  
— Grand Ballroom
- 9:50 Scientific Session: 3rd International Congress of Physical Medicine  
— Colonial Room
- 9:50 Scientific Session: 3rd International Congress of Physical Medicine  
— North Room  
Scientific films (continuous showing) — Jefferson Room
- 10:00 Coffee Hour: Hostesses, Woman's Auxiliary, American Congress of Physical  
Medicine and Rehabilitation — Pan American Room
- 11:30 Brunch and Fashion Show: Hostesses, Woman's Auxiliary, American Congress  
of Physical Medicine and Rehabilitation — Palladium Room, Shoreham Hotel
- Noon Luncheon — Inspection of Exhibits  
Scientific films (continuous showing) — Jefferson Room
- 2:00 Annual business meeting: American Congress of Physical Medicine and Reha-  
bilitation (first session, members only) — Grand Ballroom: *current ACPM&R  
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- 2:30 Tour of Washington, D. C.: Hostesses, Woman's Auxiliary, American Congress  
of Physical Medicine and Rehabilitation

**Thursday, August 25**

- 8:00 Registration — Grand Ballroom Promenade — Inspection of Exhibits  
9:00 Plenary Session: 3rd International Congress of Physical Medicine  
— Grand Ballroom  
9:50 Scientific Session: 3rd International Congress of Physical Medicine  
— Colonial Room  
9:50 Scientific Session: 3rd International Congress of Physical Medicine  
— North Room  
Scientific films (continuous showing) — Jefferson Room  
10:00 Coffee Hour: Hostesses, Woman's Auxiliary, American Congress of Physical  
Medicine and Rehabilitation — Pan American Room  
10:30 Business Meeting: Woman's Auxiliary, American Congress of Physical Medicine  
and Rehabilitation — Virginia Room  
Noon Luncheon — At leisure  
2:00 Plenary Session: 3rd International Congress of Physical Medicine  
— Grand Ballroom  
2:50 Scientific Session: 3rd International Congress of Physical Medicine  
— Colonial Room  
2:50 Scientific Session: 3rd International Congress of Physical Medicine  
— North Room  
Scientific films (continuous showing) — Jefferson Room  
7:00 Reception: 3rd International Congress of Physical Medicine — Chinese Room  
8:00 Banquet: 3rd International Congress of Physical Medicine — Grand Ballroom  
Participating Service Unit: United States Army Chorus; dinner music by the  
Howard Lanin Orchestra (*Evening Dress*)  
10:00 Ball: 3rd International Congress of Physical Medicine — State Room  
Music for dancing by the Howard Lanin Orchestra (*Evening Dress*)

**Friday, August 26**

- 8:30 Registration — Grand Ballroom Promenade  
9:00 Plenary Session: 3rd International Congress of Physical Medicine  
— Grand Ballroom  
9:50 Scientific Session: 3rd International Congress of Physical Medicine  
— Colonial Room  
Scientific films (continuous showing) — Jefferson Room  
9:50 Scientific Session: 3rd International Congress of Physical Medicine  
— North Room  
10:00 Coffee Hour: Hostesses, Woman's Auxiliary, American Congress of Physical  
Medicine and Rehabilitation — Pan American Room  
11:00 Closing Ceremony: International Federation of Physical Medicine — Virginia  
Room  
Noon Luncheon — At leisure  
2:00 Annual business meeting: American Congress of Physical Medicine and Reha-  
bilitation (second session, members only) — Grand Ballroom: *current ACPM&R  
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4:00 Meeting: Board of Governors, American Congress of Physical Medicine and  
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# Decrease in Muscle Spasm Produced by Ultrasound, Hot Packs, and Infrared Radiation

Freeman P. Fountain, M.D.  
Jerome W. Gersten, M.D.  
and  
Orhan Sengir, M.D.  
Denver

● Static force balance was used to measure the resistance to passive lateral flexion of the neck in patients with neck muscle spasm, and to passive extension of the leg in patients with poliomyelitis. The effect of hot packs, ultrasound, and infrared on this spasm was noted. All three techniques decreased spasm in both groups of patients. Hot packs were, however, significantly most effective in poliomyelitis patients, while ultrasound was significantly least effective in neck spasm.

Despite the fact that acute muscle spasm is a frequently encountered clinical problem, there has been relatively little ability to quantitate the degree of spasm and the effect of various therapeutic approaches. Treatment has therefore been largely empirical, and exact comparison of various techniques has been difficult. This difficulty is increased because muscular spasm does not carry a universally accepted connotation and there is occasional confusion with spasticity, rigidity, and contracture. Therefore, in order to discuss muscle spasm intelligently and analyze it satisfactorily, it is first necessary to define the term and to understand its meaning, at least for the purposes of this study.

Harell and co-workers<sup>1</sup> defined spasm in skeletal muscle as "a reversible state of sustained, involuntary contraction, accompanied by muscular shortening and associated with electrical potential changes." Spasm of skeletal muscle is probably peripheral in origin in most instances and seems to provide for a functional splinting of a painful muscle or joint. This does not exclude the role which may be played by central mechanisms.

The presence of electrical activity in the muscle in spasm has led to an attempt to use electromyographic techniques to evaluate the degree of spasm.<sup>2-3</sup> Although electromyographic studies can contribute much from the standpoint of understanding of mechanisms, detailed quantitative comparisons are not easily made with this technic.

Mechanical techniques have been used widely in studies of spastic states. Pre-

vious studies carried out in this department<sup>4-5</sup> have indicated that the static force balance gives a reliable measurement of the amount of force required to initiate passive movement of the spastic extremity. In the earlier investigations only hemiplegic and paraplegic patients were examined.

In the present series of experiments the static force balance technic was extended to a study of the resistance to passive motion in patients with neck "spasm" and in poliomyelitic patients with hamstring spasm. We do not suggest that the mechanism of these two "spasms" is at all similar. Our prime purpose, however, was not an analysis of mechanisms which have been discussed in detail elsewhere,<sup>6-10</sup> but an examination of different physical therapeutic approaches in order to determine which produced the greatest measurable decrease in spasm.

An attempt was first made to determine whether the technic utilized was a valid measure of the degree of spasm. Next, of the manifold therapeutic agents which have been offered as approaches toward the problem of spasm, three of the most widely used were chosen for comparison. One of our goals was to determine whether the choice of thermogenic agent was merely a matter of personal preference, as has been suggested so often, or whether there were more significant differences among them.

Assistant Professor, Department of Physical Medicine and Rehabilitation, University of Colorado School of Medicine; formerly, Fellow of The National Foundation.

Professor and Head, Department of Physical Medicine and Rehabilitation, University of Colorado School of Medicine.

Department of Physical Medicine and Rehabilitation, University of Colorado School of Medicine.

Part of the data in this study is abridgment of a thesis submitted by Dr. Fountain to the faculty of the Graduate School, University of Colorado, in partial fulfillment of the requirements for the degree of Master of Science in Physical Medicine and Rehabilitation.

### Methods

A group of normal subjects and two groups of patients were studied. Since control values for passive extension of the knee but not for lateral flexion of the neck were available in this laboratory, the normal subjects were examined in order to determine the force required to initiate lateral neck flexion. The details of this technic will be described in this report.

One group of subjects consisted of seven patients with poliomyelitis, who no longer were febrile, but who still had pain and tightness of the hamstrings. Twenty-seven experiments were performed. Resistance to extension of the knee was tested with the static force balance, using technics described previously.<sup>5</sup> Briefly, the patient was placed in a side-lying position with the leg to be tested uppermost. The angles at the hip and knee were 130 and 120 degrees respectively (anatomic position at both joints referred to as 180 degrees). The force required to extend the leg, when applied 10 cm. distal to the head of the fibula, was measured with the static force balance. Testing was done before and after the application of hot packs, ultrasound, or infrared radiation. Three readings were taken, with the static force balance, every 5 minutes to determine whether a base line had been reached. Three readings were taken immediately after the completion of treatment, and every 5 minutes thereafter for 15 minutes. It was difficult for the patient to maintain this position for longer periods.

Sixty-three observations were made on 17 patients with "spasm" of the neck muscles. These patients had a history of acute onset of pain and limitation of neck motion, without any known trauma. Neurological examination was negative. In approximately a third of the patients there was x-ray evidence of osteoarthritis of the cervical spine. In all patients except one, there was tenderness in the upper trapezius on one side with slight tilting of the neck to that side. The technic used to measure resistance to passive movement of the head varied in details from that used for study of the hamstrings.



Fig. 1 — Static force balance in position to measure the force required to initiate lateral neck flexion: A, head testing board; B, metal table top; C, static force balance; D, plumb line.

For study of the neck muscles, the normal subject or the patient would lie supine on a plinth covered with a sponge rubber mattress. The mattress extended from the feet to the shoulders, while the head rested on a special testing board (A, fig. 1). The head testing board, 14 cm. by 15 cm., was padded on the upper surface with sponge rubber to fit the rounded contour of the occiput. This board was fitted with web straps which were tightened around the patient's forehead, across the top of the head, and under the chin. With the straps thus secured, the patient's head and the testing board moved as a single unit. The testing board rested on four  $\frac{3}{4}$ -inch ball-bearing casters mounted on the under surface. To minimize friction the casters rolled on a metal bedside table top (B, fig. 1). The metal table top was the approximate thickness of the mattress and was mounted at the head end of the plinth. Prior to each testing, the table top was adjusted so that it was level, and the patient's head was positioned so that there was no rotation with respect to the testing board. A plumb line (D, fig. 1) was used to test for this position-

ing. The static force balance (C-fig. 1) was clamped to the plinth and positioned so that the arm of the instrument was at right angles to the head testing board and touched the board directly under the patient's mastoid process, which was used as the point of reference. Readings were taken as in the studies of hamstring spasm.

The therapeutic technics analyzed were hot packs, infrared, and ultrasound. The hot packs were applied to the posterior neck muscles or the hamstrings for 20 minutes, with changes every 5 minutes. Temperatures were taken between the packs and the skin, using a thermometer. Recordings of temperature were made every 15 seconds for a minute, then every minute up to 5 minutes. Infrared radiation was applied to the same muscle groups by means of a 1,000-watt Mazda lamp positioned 16 inches from the skin surface. Ultrasound was applied at a frequency of 1 megacycle per second, using the continuous moving head technic with mineral oil coupling. The upper and middle trapezius on the tender and painful side were sounded for 5 minutes, at an intensity of either 0.95 or 1.5 watts per square centimeter. As far as the hamstrings were concerned, the intensity was the same, but sounding was given for 5 minutes to the muscle body and for 5 minutes to the region of the nerve roots.

Because of the difficulty in comparing one group of patients receiving ultrasound with another receiving hot packs or infrared, it was decided to treat each patient with all three technics on consecutive days as far as possible. In each group of three treatments, the order in which the technics were applied might very well play a role in the magnitude of effect achieved. To minimize this factor, the order of application in each group of three was randomized so that approximately as many patients received ultrasound as the initial treatment as received hot packs or infrared. It was hoped that there would then be no advantage to any therapeutic technic which might depend upon its order of application.

## Results

In the normal subject, the average force necessary to initiate lateral neck flexion was 2 oz., with no significant difference between the right and the left sides. The results for all patients with neck spasm were combined, for the presence or absence of cervical osteoarthritis played no role that could be determined in this study. In the patient with neck spasm, the average force necessary to initiate lateral flexion when applied on the painful side was 12 per cent greater than that required when force was applied on the nonpainful side ( $p < .001$ ). Even with force application from the nonpainful side, however, the resistance to movement was significantly greater than in the normal subject ( $p < .001$ ). The following values and results are those obtained from measurements of force when applied on the same side as the neck pain.

In one group of patients that was followed for a longer period of time, the force required to initiate movement decreased as clinical improvement and decrease in pain occurred. In the initial phases of treatment, with pain that could be classed as severe, the average force was 10.6 oz. With moderate pain, the average reading was 7.8 oz., while with minimal pain it was 4.8 oz., still above control levels. The control values for force required to initiate movement were almost exactly the same in the three groups (infrared, hot packs, and ultrasound). The effects of these forms of therapy may be noted in figure 2. All three technics produced a significant decrease in the amount of force required to initiate movement, with the maximal decline apparent only 10 to 15 minutes after the termination of treatment. The effects of hot packs and infrared on spasm were almost identical, and were significantly greater than the effect of ultrasound.

In patients with poliomyelitis, and with acute spasm of the hamstrings, these three procedures again produced significant decreases in muscle spasm (fig. 3). The degree of decrease in spasm in these patients and in those with neck muscle spasm was quite similar.

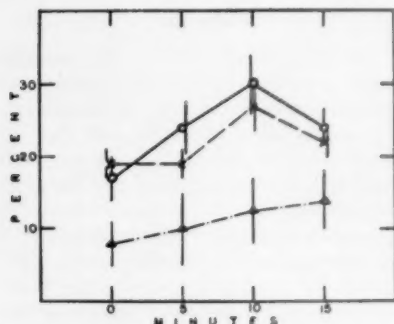


Fig. 2 — Effect of ultrasound (triangles), infrared (crosses), and hot packs (open circles), on the force required to initiate lateral flexion of the neck in patients with neck spasm. The abscissa represents the time after completion of treatment, the ordinate the per cent decrease in this force. The vertical lines represent one standard error from the mean per cent decrease.

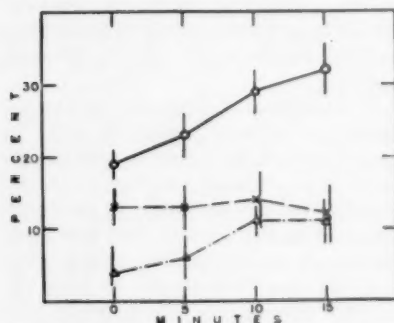


Fig. 3 — Effect of ultrasound (triangles), infrared (crosses), and hot packs (open circles) on the force required to initiate extension of the leg in patients with poliomyelitis. The abscissa represents the time after completion of treatment, the ordinate the per cent decrease in this force. The vertical lines represent one standard error from the mean per cent decrease.

Unlike the previous group, however, hot packs were significantly more effective ( $p < .001$ ) than infrared or ultrasound at all times studied. During the first 5 minutes after completion of treatment, infrared was significantly more effective in decreasing spasm — as measured by these technics — than was ultrasound ( $p < .05$ ). After this time, no difference could be detected between these two.

#### Discussion

The static force balance measures only one phenomenon — the force required to initiate movement about a joint. It

was shown in previous studies<sup>4, 5</sup> that this technic gives some measure of the degree of spasticity, although it obviously does not completely describe it. In similar fashion, it was felt from this study that the technic gives some indication of the degree of spasm of the neck muscles in "fibrositis" and of the hamstrings in poliomyelitis. The difference between the results achieved in the normal subject and in the patient with pain and palpable muscle spasm, and the decrease in force required to initiate movement as treatment progressed and the patient became more and more free of pain, suggested strongly that the static force balance could provide a meaningful measurement of the degree of muscle spasm.

All three means of therapy tested produced subjective relief of pain and spasm and measurable objective decreases in the amount of force required to move the part. It was surprising to note that the magnitude of the decrease was not the same using technics which are widely accepted. In the patients with neck spasm, ultrasound produced spasm relief which was significantly smaller than that produced by hot packs or infrared radiation. In poliomyelitic patients, hot packs were significantly better than infrared radiation or ultrasound.

Differences between various therapeutic agents had been noticed in previous studies of spasticity.<sup>11-13</sup> Ultrasound produced the most marked temporary decrease in spasticity, infrared at high intensities lesser, but still significant effects, while lower doses of infrared, hot packs, and paraffin produced no significant changes.

It is therefore difficult to substantiate the frequently reiterated statement that heat effects are similar no matter what the source. Even excluding the possible nonthermal effects of ultrasound,<sup>14</sup> there are significant differences in heat distribution with different sources. Ultrasound produces deeper rises of temperature than the other sources, with relatively greater rises of temperature at interfaces, such as bone-muscle and nerve-muscle.<sup>15</sup> Infrared energy produces mainly superficial temperature rise initially with mus-



cle temperature increasing more gradually.<sup>16</sup> Hot packs also have a predominantly superficial thermal effect, though a temperature rise of 3 to 5 C. in muscle may occur with longer heating.<sup>17</sup> The temperature pattern with hot packs is, however, not the same as with infrared, for the rise is far quicker with the hot pack, and there is the alternating quick rise and more gradual fall of temperature, as the hot pack is ordinarily applied therapeutically.<sup>17</sup> Furthermore, the intense sensory stimulation with hot packs may play a significant role in the apparently greater relaxation. It has been suggested that the sedative effects of heat are mediated via the peripheral nerve endings.<sup>18</sup> Furthermore, experimental studies in cats have shown that the effects of hot packs on striated muscle are decreased following sensory nerve block or surface anesthesia.<sup>19</sup>

It is admitted, of course, that all these suggestions are in the realm of hypothesis. We can only state that effects were not identical at doses used in this study.

It should be noted in passing that there was an increased resistance to lateral flexion of the neck not only when the force was applied on the painful side, but also when applied to the side that may not have been at all tender. There was, of course, more resistance to stretch of the painful muscle than to stretch of the contralateral one. This suggests that a painful focus on one side of the neck results in a splinting of muscle groups on both sides. Treatment to the painful side resulted in decreased resistance to passive motion when the force was applied to the nonpainful side.

### Summary

The static force balance was used to measure the resistance to passive lateral flexion of the neck in patients with neck muscle spasm, and to passive extension of the leg in patients with poliomyelitis. The effect of hot packs, ultrasound, and infrared on this spasm was noted. All three technics decreased spasm in both groups of patients. Hot packs were, however, significantly most effective in poliomyelitis patients, while ultrasound was significantly least effective in neck spasm.

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Information relative to securing reprints of this study may be had by checking the Reader Service column on page iv of this issue.



He whose business it is to bore pearls, must do this work carefully in order not to mar their beauty by haste. Even so, he who undertakes the cure of human bodies — the noblest creations on earth — should thoroughly consider the diseases with which he comes in contact and give his directions after careful reflection, so that he fall into no irremediable error.

— ISAAC ISRAELI (Isaac Judeus)

# Electromyographic Findings in Adults with Myxedema: Report of 16 Cases

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● Though electromyography is now widely utilized as a diagnostic procedure, much remains to be learned concerning specific findings in various pathologic conditions. Myxedema, which can be considered a severe degree of hypothyroidism, is rarely seen in clinical practice today. It is a disease involving general metabolic activity and affects multiple systems within the body including the skin, blood, ear, nose and throat, heart and blood vessels, stomach and intestinal tract, genitourinary tract, and also the musculo-skeletal and nervous systems. It is not surprising that abnormalities are frequently seen on electromyographic study. This report summarizes the findings in 16 patients with primary or secondary myxedema.

Although electromyography is now widely utilized as an aid in diagnosis, little is known concerning characteristic electromyographic findings in the rarer diseases, such as myxedema, which is infrequently seen in clinical practice today even in large medical centers. In this disease, which can be considered a severe form of hypothyroidism, there is a deficiency in the production and circulation of thyroxine. When it occurs in adults, there is a general reduction in metabolic activity, which may be difficult to recognize clinically in its early stages, as it affects many systems in the body including the skin and hair; ears, nose, and throat; heart and blood vessels; stomach and intestinal tract; genitourinary organs; and the musculoskeletal and nervous systems. Because we could find no report in the medical literature concerning electromyographic findings in a series of patients with myxedema, we undertook such a study at the Cleveland Clinic.

Over a period of 2 years, 16 patients with primary or secondary myxedema examined in the department of endocrinology were referred for electromyography. In several of these patients, electromyograms were repeated at intervals of from 3 to 6 months, during which time they received thyroid therapy. This paper presents a summary of our findings in this series of patients and a review of the pertinent literature.

## Report of Cases

**Case 1.** This 62-year-old salesman had surgical removal of a chromophobe adenoma and deep roentgen therapy to the pituitary gland in 1939, following which there was gonadotropic failure. Ten years previous to this operation, he had a partial thyroidectomy for a non-toxic adenoma. In 1947 he had a myocardial infarction. For 3 years he had increased difficulty with vision in his left eye; examination in August, 1958, revealed a bitemporal hemianopsia. A course of 3,000 r cobalt-60 teletherapy was given to the pituitary gland, but with little benefit. Two months later, as a preliminary to further surgery, he was referred for reduction in weight to the department of endocrinology, where a diagnosis of secondary myxedema was made. He was found to be 30 per cent overweight; his basal metabolic rate (BMR) was minus 6 per cent serum cholesterol 272 mg./100 ml., 24-hour  $I^{131}$  uptake 27 per cent, and protein-bound iodine (PBI) 4 mcg./100 ml. An electromyogram was reported as questionably abnormal, with a few fibrillations in two of five muscles, slightly increased irritability, and evidence of fatigue upon sustained contraction. A weight-reduction diet, 1 gr. of desiccated thyroid daily, and 50 mg. of cortisone daily were prescribed.

**Case 2.** This 56-year-old divorcee, a buyer for an industrial firm, was diagnosed in December, 1958, as having myxedema. She had previously been treated for cirrhosis of the liver, for presumed esophageal varices, and for macrocytic

Read at the Thirty-seventh Annual Session of the American Congress of Physical Medicine and Rehabilitation, Minneapolis, September 2, 1959.

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anemia. Her blood pressure was 150/90 mm. Hg, BMR minus 21 per cent, serum cholesterol 171 mg./100 ml.,  $I^{131}$  uptake 7 per cent. There was no response to thyroid-stimulating hormone (TSH). The electromyogram was interpreted as probably normal, although slightly increased irritability was noted.

*Case 3.* This 42-year-old man, a cook, had symptoms of myxedema of 2 months' duration. He had been known to have diabetes mellitus for 15 years with associated retinopathy and peripheral neuropathy. His BMR was minus 32 per cent, serum cholesterol 349 mg./100 ml., PBI 1.8 mcg./100 ml. The electromyogram was reported as abnormal, with 1 plus to 2 plus fasciculations in all eight muscles tested, questionable fibrillations in one muscle, increased irritability and occasional trains of potentials associated with cramping after sustained contraction.

*Case 4.* This 46-year-old housewife had diabetes mellitus for 23 years with associated retinopathy. She had been taking thyroid for 10 years but had discontinued it 6 months before examination. She was 10 per cent underweight; her BMR was minus 23 per cent, serum cholesterol 268 mg./100 ml.,  $I^{131}$  uptake 3 per cent. There was no response to TSH. Her electromyogram was interpreted as abnormal, with 1 plus to 2 plus fibrillations and increased irritability in two of three muscles and 1 plus sharp waves and questionable fasciculations in one of three muscles. A diagnosis of myxedema with mild anemia was made. The patient was advised to take  $1\frac{1}{2}$  gr. of desiccated thyroid daily and lente insulin. There was great improvement noted at time of reexamination 6 months later.

*Case 5.* This severely disabled 58-year-old man had myocardial infarcts in 1952 and 1953, thrombosis of an artery in the midbrain in 1952, and occlusion of the left iliac artery in 1956. Symptoms of myxedema developed after therapeutic administration of  $I^{131}$  at another hospital in 1957, one year before his examination. He also had peripheral neuropathy secondary to the myxedema. He was 15 per cent underweight; his

BMR was minus 6 per cent, serum cholesterol 300 mg./100 ml. His electromyogram was abnormal, with 2 plus to 4 plus fasciculations in four of seven muscles, 1 plus sharp waves in one of seven muscles, increased irritability, and occasional trains of potentials occurring with cramping on sustained contraction. He was advised to take digitalis, nitroglycerin, and  $\frac{1}{2}$  gr. of desiccated thyroid daily.

*Case 6.* This 45-year-old woman was diagnosed as having mild myxedema and Hashimoto's struma. She was 5 per cent underweight; her BMR was minus 23 per cent, serum cholesterol 453 mg./100 ml.,  $I^{131}$  uptake 7 per cent, and PBI 1 mcg./100 ml. There was no response to TSH. The electromyogram was reported as normal. She was advised to take 1 gr. of thyroid twice a day.

*Case 7.* This 42-year-old part-time stenographer and housewife for the preceding four years noted general weakness and fatigue, numbness and aching in the extremities, shortness of breath and substernal pain upon exertion, coldness, bloating and eructation, constipation, enlargement of hands and feet, slight loss of hair, decreased libido, and many other symptoms. A diagnosis of myxedema with secondary angina pectoris was made. Her blood pressure was 94/70 mm. Hg and her pulse rate 60. Her BMR was minus 33 per cent, serum cholesterol 492 mg./100 ml.,  $I^{131}$  uptake 7 per cent. There was no response to TSH. Her electromyogram was normal except for evidence of fatigue after 45 seconds of sustained contraction against resistance. She was advised to take  $\frac{1}{2}$  gr. of desiccated thyroid daily which was gradually increased to 2 gr. daily. After 3 months, another electromyogram revealed 1 plus to 2 plus fibrillations in one third of samplings in two muscles tested, increased irritability, and evidence of fatigue in one muscle; at that time her BMR was minus 3 per cent and serum cholesterol 168 mg./100 ml. After 3 months, an electromyogram was normal except for minimal evidence of fatigue; at that time her BMR was plus 7 per cent.

*Case 8.* This 72-year-old housewife had been staggering when walking and

had dizziness for five months. On the basis of these and other symptoms and typical physical findings, a diagnosis of myxedema was made. She was 10 per cent overweight; blood pressure was 160/108 mm. Hg. Her BMR was minus 32 per cent, serum cholesterol 459 mg./100 ml.,  $I^{131}$  uptake 6 per cent and PBI 1.3 mcg./100 ml. There was no response to TSH. The electromyogram was abnormal: 1 plus fibrillations in 10 per cent of samplings in one of two muscles, 1 plus fasciculations in 10 per cent of samplings in both muscles tested, and increased irritability. She was advised to take 1 gr. of desiccated thyroid daily; after 9 months of therapy the dosage had been gradually increased to 2 gr. daily. After 6 months, an electromyogram showed evidence of increased irritability and 1 plus fasciculations in one of three muscles tested. After four months, another electromyogram showed 3 plus fibrillation in 20 per cent of samplings and increased irritability in two of three muscles, and 1 plus fasciculations in three of three muscles tested (20 to 50 per cent of samplings); at this time her BMR was minus 8 per cent. She tolerated thyroid medication well.

*Case 9.* This 54-year-old housewife was referred for evaluation of open-heart surgery; she had had rheumatic heart disease with mitral stenosis since the age of 20 years, and several episodes of congestive failure with atrial fibrillation during the immediately preceding 4 years. On the basis of other symptoms and signs, a diagnosis of myxedema was made, which was thought to have been present about 4 years. She was 15 per cent overweight, blood pressure was 144/96 mm. Hg, and pulse rate 64. BMR was minus 8 per cent, serum cholesterol 321 mg./100 ml., and PBI 1.6 mcg./100 ml. The electromyogram was abnormal, with increased irritability, 2 plus fibrillation in one of three muscles, and evidence of fatigue in two muscles after from 1 to 2 minutes of sustained contraction against resistance. Since surgery was contraindicated, she was advised to take  $\frac{1}{2}$  gr. of desiccated thyroid, which was to be gradually increased to 1 gr. daily.

*Case 10.* This 60-year-old housewife noted swelling of eyes, dry skin, hoarseness, and weakness in the legs about four months before examination. In addition, she had muscle soreness, wheezing, a stuffy nose, a heavy feeling in the head, and dizziness. A diagnosis of myxedema was readily made. She was 10 per cent underweight. Her BMR was minus 4 per cent, serum cholesterol 428 mg./100 ml., PBI 1.6 mcg./100 ml., and  $I^{131}$  uptake 10 per cent. The electromyogram was abnormal, with slightly increased irritability, 1 plus fibrillations in 5 per cent of samplings in two of three muscles tested, a train of fibrillation-like potentials observed on one occasion, and evidence of fatigue upon sustained contraction for 40 seconds. She was advised to take  $\frac{1}{4}$  gr. of desiccated thyroid daily, which was gradually increased after a fortnight to  $\frac{3}{4}$  gr. daily.

*Case 11.* This 58-year-old housewife's presenting symptoms were severe headache, blackout spells, and dizziness of one month's duration. She had undergone a thyroidectomy 40 years previously. For the past year she had been treated for pernicious anemia. Diagnoses were made here of severe myxedema, rheumatic heart disease with mitral stenosis, angina pectoris, and outlet syndrome. She was 25 per cent underweight; pulse rate was 56, blood pressure was 140/80 mm. Hg. Her BMR was minus 21 per cent, serum cholesterol 384 mg./100 ml., and PBI 0.4 mcg./100 ml. After the patient received a course of desiccated thyroid,  $\frac{1}{2}$  gr. every other day for 2 weeks, an electromyogram was performed and was interpreted as being questionably abnormal, with slightly increased irritability and 1 plus fibrillations briefly observed in one of two muscles tested. After 6 months, an electromyogram showed 2 plus fibrillations in 10 per cent of samplings and occasional trains of fibrillations in one of two muscles tested; her BMR at this time was minus 9 per cent and serum cholesterol was 353 mg./100 ml.

*Case 12.* This 32-year-old housewife had fatigue and shortness of breath of 2 years' duration and numbness of fingers for the past month. She had had a



thyroidectomy 15 years previously. She had been taking a questionable amount of thyroid preparation daily for 13 years. She was diagnosed as having exogenous obesity, outlet syndrome, and suspected myxedema. She was 85 per cent overweight; her blood pressure was 130/98 mm. Hg and the pulse rate was 76. Her BMR was minus 13 per cent, serum cholesterol 536 mg./100 ml.,  $I^{131}$  uptake 11 per cent, and PBI 2.5 mcg./100 ml. The electromyogram was interpreted as essentially normal.

**Case 13.** This 51-year-old inspector in an assembly plant had bilateral vocal cord paralysis and myxedema since a partial thyroidectomy for a toxic goiter in 1931. He was 10 per cent underweight, with blood pressure 124/84 mm. Hg, and pulse rate 56. His BMR was plus 1 per cent, serum cholesterol 200 mg./100 ml., PBI 1.1 mcg./100 ml. The electromyogram was abnormal, with 3 plus fibrillations and evidence of fatigue with sustained contraction in two of three muscles and with bizarre train of potentials with muscle cramp appearing on one occasion. The patient improved rapidly on a course of  $\frac{1}{2}$  gr. of desiccated thyroid daily, which was increased gradually to  $1\frac{1}{2}$  gr. daily.

**Case 14.** This 62-year-old farmer's wife had been taking 2 gr. of desiccated thyroid daily for five years, up until one month prior to admission to the hospital with a presenting symptom of pain in the right lower quadrant of the abdomen. Diagnoses were made of myxedema and polyposis of the colon. She was 20 per cent overweight, blood pressure was 120/80 mm. Hg, and pulse rate 56. Her BMR was minus 28 per cent, serum cholesterol 510 mg./100 ml., and  $I^{131}$  uptake 6 per cent. There was no response to TSH. Her electrocardiogram showed myocardial and myxedema changes. Her electromyogram was abnormal with 1 plus fibrillation in two of four muscles tested and evidence of fatigue. Because of myxedema, surgery was deferred for 6 months.

**Case 15.** This 50-year-old housewife had exhibited obsessive-compulsive behavior for three years. Because of typical signs, diagnoses of myxedema and possi-

ble Hashimoto's struma were made. She was 10 per cent underweight. Her BMR was minus 20 per cent, serum cholesterol 498 mg./100 ml., and  $I^{131}$  uptake 4 per cent. There was no response to TSH. Her electromyogram was abnormal, with 2 plus fibrillation in one of two muscles, increased irritability, and evidence of fatigue. She was advised to take  $1\frac{1}{2}$  gr. of desiccated thyroid daily.

Table 1: Frequency of Symptoms and Signs in 16 Patients with Myxedema

Symptoms and Signs	No. of Patients
<b>Skin, hair, and nails</b>	
Dry, cool, scaly skin	14
Puffy eyes, face and hands	9
Yellowish pallor	8
Coarse, brittle hair	6
Loss of axillary and pubic hair	5
Thinning of eyebrows	2
<b>Ear, nose, and throat</b>	
Hoarse, husky voice	10
Thick, broad tongue	4
Hearing loss	3
Vertigo, dizziness	3
Rhinorrhea	2
<b>Cardiovascular system</b>	
Shortness of breath	8
Electrocardiographic changes	8
Angina pectoris, previous infarct	6
Secondary anemia	4
Slow pulse rate	2
Enlarged heart	1
<b>General metabolism</b>	
Cold intolerance	12
Obesity	5
<b>Gastrointestinal system</b>	
Bloating, eructation	5
Constipation	5
Anorexia, nausea	4
Achlorhydria	1
<b>Genitourinary system</b>	
Loss of libido, impotency	3
Dysmenorrhea, oligomenorrhea	2
Menorrhagia	2
<b>Neuromuscular system</b>	
Myxedema reflex	15
Weakness, fatigability	13
Lethargy, slow thinking, drowsiness	9
Stiffness, aching, cramps, arthralgia	9
Nervous tension, headache, irritability	8
Tingling, paresthesias	7
Peripheral neuropathy	2
Low back pain	1
Muscular hypertrophy	1
Obsessive-compulsive neurosis	1



*Case 16.* This 32-year-old unmarried secretary had weakness and nervousness of five years' duration. On the basis of typical findings, diagnoses of myxedema and paroxysmal tachycardia were made. She was 20 per cent underweight, blood pressure was 120/70 mm. Hg, and pulse rate 88. Her BMR was minus 26 per cent, serum cholesterol 300 mg./100 ml.,  $I^{131}$  uptake 6.4 per cent, and PBI 8.3 mcg./100 ml. (This high value was related to exogenous medication.) Her electrocardiogram showed typical myxedema changes. The electromyogram was reported as abnormal, with slightly increased irritability, 1 plus to 2 plus fibrillation and 1 plus fasciculation potentials in two of four muscles, and 1 plus motor unit potentials in one of four muscles tested. She was discharged and advised to take  $\frac{1}{2}$  gr. of desiccated thyroid every other day, which dosage was gradually increased. After two months she felt much improved.

#### Discussion

For the sake of brevity, no attempt was made in the report of cases to describe in detail each patient's symptoms or clinical history. As an alternative, table 1 was prepared to indicate the frequency of various symptoms and signs in this series of 16 patients with myxedema. This table gives a rather striking picture of the surprising diversity and protean nature of this disease, which can simultaneously affect many systems within the body. The most common findings in our series were the following: the typical dry, cool, somewhat scaly skin of a rather yellowish color; puffiness of the eyes, face, and hands; coarse, brittle, rather sparse hair; hoarseness of the voice; shortness of breath and substernal distress upon exertion; electrocardiographic changes; intolerance to cold; obesity; constipation and gaseous distension; the "myxedema reflex," which is the typically delayed relaxation phase of deep tendon reflexes; generalized weakness and fatigability, with drowsiness, slowing of mental activity, and muscular complaints (stiffness, aching, cramps); increased nervous tension and headaches; and paresthesias in the extremities.

Table 2 summarizes the laboratory data in our series, which consists of 12 women and 4 men, ranging in age from 32 to 72 years. The average age for both sexes is almost identical, being 51 years for the women and 52 years for the men. Fifteen patients had primary myxedema resulting from disturbance in function of the thyroid gland; one patient (case 1) had secondary myxedema caused by hypopituitarism.

In comparison with the incidence of cardiovascular symptoms, the pulse rates and blood pressure determinations seem surprisingly low. The highest pulse rate was 88, found in two patients, and the lowest was 56, found in three patients. Slightly elevated blood pressures were present in three women, with 160/108, 144/96, and 130/98 mm. Hg, respectively.

The body weight of three patients in our series was about normal. Five patients were 5 to 10 per cent underweight, two patients 15 to 20 per cent, and one patient was 25 per cent. In the other direction, two persons were 10 to 15 per cent overweight, two persons 20 to 30 per cent, and one person 85 per cent. It should be noted that this last patient (number 12 in our series) was the only one about whom there is some doubt as to whether or not she actually had myxedema.

The basal metabolic rates for our patients ranged from minus 33 to plus 1 per cent. It is important to note that 6 myxedematous patients in our series had BMR's which were above minus 15 per cent, and thus were in the lower range of values for normal individuals. Therefore, it is evident that not too much emphasis can be placed upon the BMR as an absolute diagnostic test for myxedema.

The serum cholesterol values which ranged from 171 to 536 mg./100 ml., were elevated in 12 patients. Four patients had values below 300 mg./100 ml., which can be considered within the normal range; these were 171, 200, 268, and 272 mg./100 ml., respectively.

The 24-hour radioiodine ( $I^{131}$ ) uptake was determined in 10 patients, 7 of whom had values which are expected in myxedema, that is, below 10 per cent.

The three other patients had 24-hour  $I^{131}$  uptakes of 11, 15, and 27 per cent, respectively; patient 12 had questionable myxedema; patient 6 had Hashimoto's struma in addition to myxedema, in which combination the  $I^{131}$  uptake frequently is normal; and patient 1 had pituitary failure, in which case the  $I^{131}$  uptake commonly is normal.

The 6-hour  $I^{131}$  uptake after administration of 5 units of thyroid stimulating

hormone (TSH) was determined in 7 patients. In none of these patients was there any significant increase in  $I^{131}$  uptake over that obtained without TSH.

Protein-bound iodine (PBI) determinations were obtained in 10 patients. All had significantly low values (less than 3.5 mcg./100 ml.) except patient 1 (4 mcg./100 ml.) who had secondary myxedema, and patient 16 (8.3 mcg./100 ml.). The explanation for this last sur-

Table 2: Laboratory Data of 16 Adults with Myxedema

Patient No.	Age and Sex	Pulse and Blood Pressure	Body Weight	BMR	Serum Cholesterol (Mg. per 100 ML.)	24-Hour $I^{131}$ Uptake	TSH Response	PBI (Mcg. per 100 ML.)
1	62 M	88 140/90	+30%	-6%	272	27%		4
2	56 F	80 150/90	Normal	-21%	171	7%	None	
3	42 M	68 140/80	Normal	-32%	349			1.8
4	46 F	80 124/70	-10%	-23%	268	3%	None	
5	58 M	62 138/70	-15%	-6%	300			
6	45 F	68 130/80	-5%	-23%	453	15%	None	1.0
7	42 F	60 94/70	Normal	-33%	492	7%	None	
8	72 F	76 160/108	+10%	-32%	459	6%	None	1.3
9	54 F	64 144/96	+15%	-8%	321			1.6
10	60 F	68 130/75	-10%	-4%	428			1.6
11	58 F	56 140/80	-25%	-21%	384			0.4
12	32 F	76 130/98	+85%	-13%	536	11%		2.5
13	51 M	56 124/84	-10%	+1%	200			1.1
14	62 F	56 120/80	+20%	-28%	510	6%	None	
15	50 F	72 124/80	-10%	-20%	498	4%	None	
16	32 F	88 120/70	-20%	-26%	300	6.4%		8.3

Table 3: Electromyographic Findings in 16 Patients with Myxedema

	Patient Number															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Normal electromyogram			?			x	?				?					
Questionably abnormal electromyogram																
Slightly increased irritability		x	x								x					
Few abnormal potentials		x									x					
Evidence of fatigue		x					x									
Abnormal electromyogram																
Fasciculations				x	?	x		x								x
Fibrillations				?	x			x	x	x			x	x	x	x
Sharp, positive waves					x	x										
Trains of potentials			x		x					x		x				
Increased irritability			x	x	x			x	x	x					x	x
Evidence of fatigue									x	x			x	x	x	x

prisingly high value was that the patient had had a cholecystogram some months previously, which provided a source of extraneous iodine.

#### Electromyographic Findings

The electromyographic reports in this series of 16 patients with myxedema are summarized in table 3. On the basis of the findings, the electromyograms were reported as normal, questionably abnormal or abnormal.

The electromyogram of one patient was reported as normal without any qualifications. In other words, there was no evidence of increased irritability upon insertion and probing with the needle electrode, there was electrical silence when the patient's muscle was completely relaxed, and there were normal motor unit potentials and normal interference patterns visualized when the patient evoked minimal and maximal muscular contraction, respectively. In three other patients, the electromyograms were reported as probably normal. In one case, there was slightly increased irritability to needle probing; in the other two cases, there was evidence of fatigue with sustained voluntary contraction against resistance, which might be attributed to their generalized weakness and fatigability. In none of these three electromyograms were the findings considered of sufficient significance to classify them as questionably abnormal.

The electromyograms of two patients were reported as questionably abnormal. In patient 1, who had secondary myxedema, there was slightly increased irritability upon needle insertion and movement, a few abnormal fibrillation potentials at rest in two of five muscles tested, and evidence of fatigue upon sustained contraction against resistance. In patient 11, slightly increased irritability and a few fibrillations were observed briefly in one of two muscles tested; incidentally, after this patient had 6 months of thyroid therapy, another electromyogram was reported as definitely abnormal.

The electromyograms of 10 patients were reported as abnormal on the basis of varying combinations and degrees of

the following findings: appearance of potentials (fasciculations, fibrillations, or sharp, positive waves) when the muscle was relaxed, occasional bizarre trains of potentials, increased irritability upon insertion and probing with the needle electrode, and evidence of fatigue after sustained contraction of the muscle against resistance. In each of these electromyograms, the abnormal findings were more definite than in those classified as questionably abnormal.

Definite fasciculation potentials were found at rest in the electromyograms of four patients. In the two patients in whom these potentials were graded as more than 1 plus (patients 3 and 5) diagnoses of peripheral neuropathy had been made. In patient 3, who had 1 plus to 2 plus fasciculations in all eight muscles tested, neuropathy was related to uncontrolled diabetes of 15 years' duration. In patient 5, who had 2 plus to 4 plus fasciculations in four of seven muscles tested, neuropathy was attributed to myxedema that was caused by administration of a therapeutic dose of  $I^{131}$  at another hospital; the neuropathic condition was markedly benefited by thyroid therapy. In the other 2 patients, both of whom had 1 plus fasciculations in one or two of the muscles tested, there was nothing to suggest peripheral neuropathy in their symptoms or clinical findings except that patient 8 complained that for 5 months she had the tendency to stagger when walking.

Questionable fasciculation potentials were found at rest in the electromyogram of patient 4 in one of three muscles tested. Although this patient had been a diabetic for 23 years and had grade 2 diabetic retinopathy, there was no clinical evidence of peripheral neuropathy. Also observed in the electromyogram were increased irritability and 1 plus to 2 plus fibrillations in two of three muscles tested and 1 plus sharp waves in one of the muscles.

Definite fibrillation potentials were observed at rest in the electromyograms of eight patients. In four of these patients, myxedema was the only diagnosis; in the others, diabetes mellitus, rheumatic heart disease, polyposis, or obsessive-

compulsive neurosis were also diagnosed. The fibrillation potentials were graded from 1 plus to 3 plus in the various patients; however, only in one patient were 3 plus fibrillation potentials seen on the electromyogram. In no instance were typical denervation fibrillation potentials observed.

Bizarre trains of abnormal potentials were seen on the electromyograms of four patients, in three of whom they were associated with muscle cramps. Increased irritability was reported in eight and evidence of fatigue upon sustained contraction in five electromyograms.

#### Review of Literature

Sir William Gull,<sup>1</sup> who was the first clinician to describe the disease myxedema, wrote in 1874 that there was most likely some primary change in "the integuments, the muscles, and the nervous tissues of the cerebrospinal system." Better understanding of the pathology of myxedema was to come in later years, but it is notable that interest in the muscle abnormality occurring in this disease dates back to the time of its recognition as an entity.

In rare cases, the muscle involvement in myxedema is the outstanding feature; in myxedematous adults, the combination of markedly hypertrophied muscles, weakness, fatigability, and slowness of movement is called Hoffman's syndrome. These persons resemble, to some extent, patients with myotonia. Thomasen<sup>2</sup> studied such individuals and noted that in no instance did myotonic discharges occur on the electromyograms; therefore, he concluded that the muscular involvement in myxedema has no relationship to myotonia.

Hesser<sup>3</sup> studied biopsies from muscles of patients with myxedema. He found occasional areas of granular degeneration which was limited to a few fibers each. Foster and Barr<sup>4</sup> found on autopsy of a patient with myxedema similar lesions in cardiac, smooth, and striated muscle; they described these lesions as consisting of degeneration of the central portion of the sarcoplasm with the production of vacuoles containing a basophilic granular or homogeneous material.

Lambert and others<sup>5</sup> studied the Achilles tendon reflex in a large number of normal persons and of hyperthyroid and myxedematous patients. They found the average duration of this reflex to be 0.34 sec. in 280 normal persons, 0.26 sec. in 26 hyperthyroid patients, and 0.53 sec. in 115 patients with myxedema. They measured the interval between the stimulus and the muscle contraction, which was from 0.03 to 0.04 sec. in all persons. From these data, they concluded that the increased reflex time in myxedematous patients was not due to slowing of conduction rate in the nerve but due rather to an abnormality in the contractile mechanism of the muscle fibers.

Lambert and Sayre<sup>6</sup> conducted an interesting series of electromyographic and histologic studies in 29 thyroidectomized rabbits. On serial electromyograms for periods extending up to two years in these rabbits, trains of positive waves and spikes were observed which resembled the electric activity of myotonic muscle; these abnormalities were most marked one to two months after thyroidectomy. On muscle biopsies, scattered lesions were seen consisting of vacuolated muscle fibers, fibers in various stages of hyaline degeneration, and some evidence of regeneration of muscle fibers. Nerves appeared undamaged. In five thyroidectomized rabbits, treatment with triiodothyronine caused abnormal electric activity to disappear in three to six weeks.

Ross and co-workers<sup>7</sup> in a report concerning severe uterine bleeding and degenerative skeletal muscle changes in unrecognized myxedema, reported that in the electromyograms they did not observe any denervation fibrillation or fasciculation potentials but did note abnormal irritability of muscle fibers to movement of the needle electrode and occasional trains of positive waves. After 3 months, during which time the patient was treated with dessicated thyroid, the abnormal findings on the electromyogram were less evident. On muscle biopsy, the authors noted diffusely scattered muscle fibers in various stages of degeneration and also occasional regenerating fibers.

### Summary

Electromyograms were performed on 16 patients with primary or secondary myxedema. Ten of these electromyograms were interpreted as abnormal, two as questionably abnormal, and four as essentially normal. The most typical findings in the abnormal electromyograms were 1 plus to 2 plus fibrillation potentials occurring at rest, increased irritability upon insertion and probing with the needle electrode, evidence of fatigue upon sustained contraction against resistance, and occasional bizarre trains of potentials which frequently were associated with cramping. In the electromyograms of four patients, 1 plus to 4 plus fasciculation potentials were observed at rest, but two of these patients had, in addition to myxedema, definite peripheral neuropathy. In no cases were denervation fibrillation or highly polyphasic fasciculation potentials seen.

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Information relative to securing reprints of this study may be had by checking the Reader Service column on page iv of this issue.



In this world there are only two tragedies. One is not getting what one wants, and the other is getting it. The last is much the worst; the last is a real tragedy!

—OSCAR WILDE

# Special Problems in Total Medical Care of the Handicapped Patient After Hospital Discharge: Two Case Reports

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● When a disabled patient returns home after completed hospital care he faces many new and difficult problems. The achievement of maximum independence and the potentialities for gainful work are of prime importance. This phase of the patient's total care is often neglected. Two cases of poliomyelitis, which illustrate the multiplicity of problems and how teamwork helped to solve them, are presented. For one patient with quadriplegia an electric hoist was installed in his bathroom. This enabled him to care for his toilet needs and manage alone during the day while his wife was away on her job as a school teacher. For the second patient with paraplegia a new apartment without stairs, a car with hand controls and a suitable job were provided. Similar problems are encountered by any patient suffering from an illness that necessitates changes in living habits or vocation. It is important that physicians in general become more aware of the importance of this phase in the patient's total care.

A disabled patient generally receives good care and excellent treatment in a rehabilitation department or center, but often too little attention is given to what happens to him after discharge to his home. The patient faces many and varied problems and, of prime importance, are the achievement of maximum independence in daily activities and the potentialities for gainful work.

This phase of the patient's total care is often neglected in spite of the fact that the success of rehabilitation must be gauged by his accomplishments after discharge to his home environment.

The main reason for this lack of follow-through may lie in the multiplicity of the problems and the fact that they cannot be solved by one person alone. Teamwork obviously is necessary to solve a problem which may include economic, vocational, social and psychological aspects. Sometimes inventiveness and ingenuity are required to solve the mechanical or technical aspects of the problem.

The following two cases from the polio ward of the Hospital for Special Surgery will illustrate some of these problems and how they were solved.

**Case 1.** A 29-year-old, white, married office manager contracted poliomyelitis in September, 1953, and developed severe paralysis of all four extremities and the trunk. He was in a respirator in another hospital until January, 1954, and

then was transferred to the Hospital for Special Surgery. After two years of rehabilitation he was ready for discharge. A muscle evaluation at that time gave the following values: left shoulder essentially flail; left elbow, wrist and hand functional except for fair minus *opponens pollicis*; muscles of the right shoulder rated fair minus to fair plus; right elbow, wrist and hand were functional except for trace *opponens pollicis*; neck muscles ranged from fair plus to normal; muscles of trunk and lower extremities were essentially flail.

Being 6'4" and weighing about 190 pounds, the patient needed considerable assistance in dressing, transfer and toilet activities. He could wheel himself around and feed himself.

The patient's wife had returned to her former job as a school teacher to support the family of three children, all of school age, and the patient would be alone in the home during the day. His main problem and worry was how to manage alone without the aid of an attendant which the family could not afford.

After experimenting in the Hubbard tank room in the hospital, using the electric hoist and an 8-inch-wide canvas belt around the patient's chest, it was found that this device could be of great help. We therefore decided to go ahead with our plan to install an electric hoist in the patient's bathroom. We received excellent cooperation from the National Foundation for Infantile Paralysis which offered to pay for the hoist and installation, including necessary structural changes in the home. The agent from a local hospital supply company assisted

Read at the Thirty-seventh Annual Session of the American Congress of Physical Medicine and Rehabilitation, Minneapolis, September 4, 1959.

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in planning and supervising the installation. To give sufficient height and strength for the hoist that part of the ceiling to which the I-beam was fastened had to be reinforced with steel plates. The bathroom door had to be widened and the floor retiled. The cost of the hoist was \$300; the installation with necessary changes about \$600.

The patient now has been home for more than three and one-half years. He has developed a daily routine and manages very well. On week days, before his wife leaves in the morning she helps him out of bed onto the wheel chair. From then on he is on his own. He wheels himself to the bathroom and here, with the help of the hoist, the canvas belt around his chest and slings for his legs, he lifts himself out of the wheel chair (fig. 1) and onto the toilet seat (fig. 2). By a slight pull on one of two ropes the patient either raises or lowers himself with the electric hoist. In the elevated position he easily can move himself to the toilet or bathtub by pushing on the wheel chair or the wall as the trolley runs on the I-beam with minimal friction. As his sitting balance is poor, while in the bathtub and on the toilet seat and also when shaving, the chest belt is kept on and pulled up taut to give body balance and free his hands for the necessary toilet activities.

To put on shoes and socks he elevates his legs with the thigh slings (fig. 3). This is also the starting position for putting on the trousers. After they are pulled up to the height of the slings he removes the slings and lifts himself from the seat with the chest belt. In this elevated position he is able to pull the trousers over his hips.

He also uses the hoist to get into and out of the bathtub. Here he needs help to put his legs into and out of the tub. Without the hoist it would be impossible for his wife to assist him in bathing.

In February, 1956, before the patient's discharge from the hospital, a counselor from the Division of Vocational Rehabilitation of New York State Department of Education was consulted for vocational guidance. A correspondence course in reading of blueprints was provided. A



Fig. 1 — In the elevated position patient transfers himself from wheelchair to toilet seat.



Fig. 2 — Patient in elevated position over toilet seat.



Fig. 3 — With left leg elevated in sling patient can reach down to put on socks and shoes.

building contractor, a personal friend, gave him additional training in calculating building costs, and after he had become proficient gave him a job as a building estimator. The blueprints are mailed to the patient and he does the estimations at home. He is not kept equally busy at all times but averages about \$50 a week.

*Case 2.* A 33-year-old, white, married mechanic contracted poliomyelitis in May, 1954. Two months later he was transferred to the Hospital for Special Surgery for rehabilitation. Muscle evaluation on admission revealed normal upper extremities, except for moderate weakness of right shoulder girdle muscles, and essentially flail abdominal and leg muscles.

During the two years the patient remained in the hospital he gradually learned the usual transfer activities and a "drag-to" gait using leg braces and crutches. He was unable to climb stairs. In addition to the physical rehabilitation, however, there were other problems that increasingly worried the patient as time for discharge approached. He needed a new apartment with no stairs to climb. He needed a new job if he was to support his family. Finally, there was the problem of transportation.

Before the patient's discharge the social worker was able to obtain an apartment in a housing project laid out for handicapped persons. It had large doors without sills through which the patient easily could wheel himself and there were no stairs to climb.

The patient obviously would not be able to return to his previous job as manager of a gas and service station. If he was to work again he would have to be retrained for a sedentary job. While in the hospital the Division of Vocational Rehabilitation gave him aptitude tests, then recommended and provided him with a course in bookkeeping and business. He completed the course ahead of time in June, 1955.

Being unable to use public transportation he needed a car with hand controls to get to and from work. A group of his overseas veteran friends held a benefit

and raised over \$1000. His old car had some trade-in value and the hospital administration donated the balance necessary for acquiring a new car with the necessary controls.

It took the Department of Vocational Rehabilitation several months before it succeeded in getting a suitable job for this patient as a reservation clerk in one of the offices of a large air line. He now earns more than \$320 a month, enough to support his family.

#### Comment and Summary

Both these cases bring out the many problems facing a physically handicapped person on discharge from the hospital. While the physical retraining is important it nevertheless becomes more or less of a routine in a rehabilitation department. The solution of the problems on discharge, on the other hand, can never become routine work since they vary so much from case to case. They need individual attention and above all, in addition to medical knowledge, they require an interest in human beings and knowledge of community resources.

Not only in crippled patients do these problems arise; any patient who suffers from an illness that necessitates changes in living habits or vocation encounters similar problems that he, only by coordinated effort, can hope to solve in a satisfactory way.

In general hospitals too little attention is given to these aspects of the patient's care. This difficult and important task is usually turned over to the social worker who does his best, but who could do better if the physician in charge would take more interest in the patient. In such cases, conferences should be held by the physician, the social worker, the therapist and the nurse in charge. Medical consultants and a vocational counselor should be called in as needed. The best possible program then can be outlined for each patient.

**Acknowledgment:** The author is indebted to Mrs. Geraldine Young, formerly of the Social Service Department of the Hospital for Special Surgery, for helping with the social aspects of both cases presented and to Mr. George Bloomer, physical therapist, for technical assistance.

## ★ survey of selected literature ★

This systematic abstracting and indexing of selected journals is made possible by a grant from the American Rehabilitation Foundation, a subsidiary of the Sister Elizabeth Kenny Foundation.

### **ACTA PHYSIOLOGICA SCANDINAVICA. Vol. 48 (Part II-III), 1960.**

#### ◇ 5-Hydroxytryptamine in Burns. Stig-Arne Johansson. pp. 126-131.

The relative amounts of 5-hydroxytryptamine (5-HT, serotonin) in skin, blood and urine after burn injuries have been determined spectrophotofluorometrically after extraction into n-butanol. Increased amounts of 5-HT in rat skin and a decrease in the number of circulating platelets accompanied by a decrease in the total amount of 5-HT in rabbit whole blood were found after burn injuries. In five human patients with severe burns an increase of the urinary excretion of the 5-HT metabolite, 5-hydroxyindole-acetic acid (5-HIAA) was found, which seems to indicate an increase in the endogen metabolism of 5-HT. It is suggested that blood platelets inactivate free 5-HT and that heparin can inhibit the liberation of 5-HT from the blood platelets in burn injuries and anaphylactic reactions.

#### ◇ The Blood Lactate During Recovery from Sprint Runs. K. Lange Andersen; A. Bolstad, and S. Sand. pp. 231-236.

In this report the authors present data showing the time required to restore the normal resting level of blood lactate, pulmonary ventilation and oxygen debt after runs of distances up to 800 metres. The experiments were performed on healthy, young, well motivated and experienced men.

Capillary blood was taken from the ear lobe at regular intervals after cessation of the run. Blood lactate was determined colorimetrically. In a few experiments the pulmonary ventilation and the oxygen debt was determined.

The time required to restore the normal resting level of blood lactate after runs of distances up to 800 metres increases as the distance becomes longer, up to a limit of about 400 metres. Longer runs do not increase the recovery time for blood lactate. Running 400 metres also is sufficient to produce the maximum blood lactate, which in this study was found to range from 120 to 150 mg. It was found that the pulmonary ventilation reaches stable values about resting level, approximately 20-25 minutes after the 100 metres run and 30-35 minutes after the 200 metres run. At that time the lactic acid concentration in the blood was still very high, which shows that the lactic acid, as such, cannot be the cause of the elevated pulmonary ventilation.

Measurements of  $O_2$ -debt after the runs revealed a larger debt for an athlete than for a non-athlete, and evidence was found indicating a greater "alactic  $O_2$ -debt" in the athlete than in the non-athlete.

It seems reasonable to recommend athletes rest 40 minutes between two 100 metres starts, and at least 75 minutes for the 400 and 800 metres runs.

The association between the relaxing and the lactic-acid stimulating effects of adrenaline in smooth muscle. *Mohme-Lundholm, E. p. 268.*

### ★ **A.M.A. ARCHIVES OF NEUROLOGY. Vol. 2, April 1960.**

#### ◇ Paroxysmal Recurrent Rhabdomyolysis. G. R. Haase, and A. G. Engel. pp. 410-419.

The symptomatology, clinical course and precipitating causes of paroxysmal recurrent rhabdomyolysis are discussed and a short review of the reported cases in the medical literature is presented. The authors report a case of a third recurrent attack following cardiac surgery,

but also associated with decreased carbohydrate intake, anesthetic agents and a minimal respiratory infection; occurring in a seven-year-old white male.

Muscle biopsy at 11 days revealed a massive and diffuse lesion with destruction of approximately 75 per cent of the muscle fibers and accompanied by evidence of marked regeneration. The patient had an increase in creatine and a decrease in creatinine excretion with a moderate impairment of his creatine tolerance. Serial manual muscle examinations, conducted five times during a four-month period, revealed the trunk and proximal leg muscles to be most affected. There was a steady improvement in muscle strength, the majority occurring in the first 10 weeks. The electromyographic picture during the same four-month period progressed from one of complete loss of voluntary potentials with fibrillation and positive waves to slight reduction of voluntary potentials; no fibrillation, but positive waves; increased polyphasic activity and decreased, but improved, voluntary potential duration. The reversal of motor unit loss was out of proportion to the recovery of strength as is often seen in myopathies.

◇ **Facial Nerve Tumors and Progressive Facial Palsy.** Stuart A. Schneck; Herman I. Laff, and James W. Stephens. pp. 452-457.

A case of progressive facial nerve paralysis due to a neurofibroma on the intrapetrous portion of the facial nerve is presented, and the signs and symptoms of 59 other tumors causing isolated facial nerve paralysis were reviewed. The main emphasis was that clinical localization of the lesion was possible and early surgical exploration of this site is warranted to prevent further damage. Clinical differentiation between lesions of the sheath of the facial nerve and intratemporal epidermoids is discussed. Lesions of the facial nerve sheath presented with pain, palpable tumor, and paralysis without preceding aural symptoms. The intratemporal lesions were usually painless, associated with aural symptoms and more often revealed x-ray evidence of the lesion.

**Pain, itch, and vibration.** Wall, P. D., and J. R. Cronly-Dillon. p. 365.

**Experimental myelopathy produced with a pyrimidine analogue.** Koenig, H. p. 463.



## AMERICAN JOURNAL OF PHYSICAL MEDICINE. Vol. 39, Feb. 1960.

◇ **Electron Microscopy of the Motor End Plate and the Neuromuscular Spindle.** J. D. Robertson. pp. 1-43.

The author reviews the literature about electron microscopic structure of motor end plates and neuromuscular spindles in vertebrates. He also presents, for the first time, certain unpublished observations on these topics.

The myelin sheath of vertebrate peripheral nerve fibers is composed of a greatly elongated Schwann cell membrane wrapped spirally around the axon. The Schwann cell membrane itself appears in thin sections as two parallel dense strata  $2 \text{ A}^\circ$  thick separated by an intervening light zone  $35 \text{ A}^\circ$  thick. This structure is called a "unit" membrane and each myelin lamella consists of two of these "unit" membranes, adhering one to the other. The "unit" membranes are characteristically separated by a gap of varying width. In the juxta-terminal myelinated region at Nodes of Ranvier this gap is closed completely. At the motor end plates in vertebrates the axon "unit" membrane and muscle "unit" membrane are separated by a gap approximately  $500 \text{ A}^\circ$  wide. Sensory endings on the other hand characteristically show no more than  $100$  to  $150 \text{ A}^\circ$  between axon and muscle membrane. It is believed that the substance in this gap, present around cells and between "unit" membranes of paired membrane structures, is a highly hydrated mucopolysaccharide gel containing about 90 per cent water.

The gap substance in the synaptic cleft is considered to be like that in mesaxons and elsewhere and hence very highly hydrated. The probability that it would serve as a semi-permeable diffusion barrier for small molecules or ions thus is less although further studies of this important material clearly are necessary. It may have a very active role in impulse transmission.

The spindle sheath, intrafusal muscle fiber, and intrafusal nerve fibers of the neuromuscular spindles also are discussed. The relationships of the terminal neural structures to the intrafusal muscle fibers in spindles has not been completely worked out. It appears, however, that the afferent nerve fibers lose their myelin sheaths before entering the perimembranous substance. The terminal axons and Schwann cells enter the perimembranous substance separately, and then appear to branch many times ending as tiny rootlets tapering down to a few hundred angstrom units in diameter before disappearing in the serial sections.

The author terminates his paper with speculation regarding function. One such supposition, based on electron microscopic observations, is the mechanism by which stretching of whole muscle results in an increase in afferent nerve volleys from the spindle. Each of the intrafusal

muscle fibers is a continuous structure running from tendon to tendon in the muscle. The spindles are localized regions in series along each muscle in which the relative number of myofibrils is greatly reduced and the area of the muscle membrane is greatly increased, the increase being taken up by markedly convoluted folds and pseudopodium-like extensions of sarcoplasm. The author theorizes that stretch of whole muscle or contraction of intrafusal fibers from afferent nerve activity would result in a smoothing out of these convoluted folds in the muscle surface. This theory is tenable since there is a reduction of the contractile element in this region and the cohesive properties of the muscle membrane would tend to keep the total area constant during stretch.



### AMERICAN JOURNAL OF PHYSICAL MEDICINE. Vol. 39, April 1960.

◇ **Changes in Blood Flow, Oxygen Uptake and Tissue Temperature Produced by Physical Agents. I. Effect of Ultrasound.** D. I. Abramson; C. Burnett; Y. Bell; S. Tuck, Jr.; H. Rejal, and C. J. Fleischer. pp. 51-62.

The local effects of ultrasound were studied in 16 male subjects. Pulsed ultrasound was applied to the forearm by two stationary sound heads incorporated in a plethysmograph. The dosage given to a subject was the maximum amount tolerated without undue discomfort. Temperatures were obtained from the upper portion of the forearm using thermocouples.

The results showed blood flow to be doubled at peak response, 15 minutes after the onset of the treatment. The augmented circulation persisted for almost one-half hour after treatment was terminated. There were no consistent systemic alterations associated with the application of ultrasound and therefore it was assumed that the changes in local circulation resulted primarily from the thermogenic effect of the modality on the vascular beds in the forearm.

Ultrasound also caused a definite increase in the oxygen uptake of the tissues with the average peak change being almost twice the control rating. The response continued for 23 minutes after termination of the treatment. Alterations in oxygen arteriovenous difference produced by ultrasound were inconsistent and therefore it can be assumed that the increase in oxygen uptake was due to a greater flow of blood rather than by more effective extraction of oxygen from each cc. of blood. Temperature recordings below the sound heads showed subcutaneous tissue to be heated to the greatest extent with peak increase of 1.4° C. over the control reading. Muscle and skin temperatures increased 0.9° C. over control temperatures.

It is concluded that the increase in oxygen uptake which accompanies the augmentation in blood flow and rise in tissue temperature preclude the use of ultrasound as therapy when an impaired local arteriocirculation exists.

◇ **Basic Considerations in the Prescribing of Wheelchairs.** S. Z. Brent. pp. 47-50.

The prescription for a wheelchair should take into consideration the individual needs of each patient. A proper wheelchair and its accessories should not be selected until the disabled individual has reached a plateau in his recovery, for only then can his needs be evaluated and resolved. A few of the needs of particular disability groups are listed below.

1. A hemiplegic is able to enter the wheelchair from the front between the arm rests and therefore needs only stationary or non-removable armrests. If the hemiplegic does not have the use of his normal leg he will need a one-arm drive wheelchair; otherwise he can propel the wheelchair with his good leg and arm.
2. The patient with a spinal cord injury must enter the wheelchair from the side, therefore needing removable arm rests.
3. The bilateral amputee requires a wheelchair with large wheels and rear axles set further back to bring the center of gravity of the wheelchair further back thus compensating for the loss of weight of his missing lower extremities. In the standard wheelchair, a 10 to 15 lb. sandbag fastened to the footrest also will serve this purpose. In addition, removable leg rests will be needed to closely approximate the wheelchair to the commode, bed, chair, or car to allow safe transfer.
4. The arthritic individual with frozen knee joints requires adjustable leg rests to be elevated to the most comfortable position for the knees. If the hips or vertebral column are involved an adjustable back may be necessary.

These are only a few of the things to consider when ordering a wheelchair. Each prescription must be well thought through since the correct wheelchair may make the difference between being bedridden or ambulatory.



Special review. Effect of nicotine and tobacco on muscle function. Fischer, E.; H. Silvette; P. S. Larsen, and H. B. Haag. p. 63.



**AMERICAN JOURNAL OF PHYSIOLOGY. Vol. 198, Jan. 1960.**

◇ Electrical Activity of Striated Muscle in Experimental Vitamin E Deficiency. J. J. Fudema; Y. T. Oester; J. A. Fizzell, and A. J. Gatz. pp. 123-127.

The similarity between the muscular atrophy of experimental animals fed diets deficient in vitamin E and the human patients with muscular dystrophy has been known for some time. This paper reports for the first time the electromyographic picture in the experimental disease. Rabbits were fed vitamin E deficient diets and electromyograms were studied at regular intervals in both the experimental group and in the controls. No evidence of electromyographic or histologic abnormality was found in the control group at any time. In the experimental group after a two-week period on the deficient diet body weight progressively decreased. The average life span was 24 days on the deficient diet. Progressive atrophy and weakness was apparent.

The first electromyographic evidence of disease was noted after 10 days on the diet. It consisted in bursts of spikes 0.5 msec. long and less than 100 mV amplitude. From 15-20 days after initiating the dietary change, fibrillation like potentials were observed in all of the experimental animals. Similar patterns were observed in the affected muscles of a second experimental group in which one peroneal nerve had been sectioned. During muscular activity motor unit potentials were observable in the vitamin deficient animals. However, progressive changes were noted. During the first 15 days on the diet potentials were considered normal. After this time progressive diminution in amplitude was noted and increased polyphasic character of the potentials. Finally, complex motor unit potentials of short duration and low amplitude were observed.

Although the electromyogram was similar in denervation and in the vitamin deficient state, the histologic picture was markedly different. The lower motor neurone and motor end plate remain normal in the deficiency disease. The changes that occur are in the atrophy and wasting of the muscle itself. The electromyographic evidence serves to confirm the similarity between the deficiency disease and human muscular dystrophy. The diseases are different in that the experimental disease is reversible with vitamin therapy whereas the human disease is not.

◇ Effect of Histamine on Small and Large Vessel Pressures in the Dog Foreleg. F. J. Haddy. pp. 161-168.

This paper constitutes a further study on the effect of histamine on various caliber blood vessels by the same author. In the current work histamine was administered locally and systemically by intra-arterial and intravenous infusion. The vessels studied were main trunk arteries and veins, small arteries and veins supplying either subcutaneous tissue or muscle in the forelimb of the dog. Intraluminal pressures in these vessels and tissue pressure were measured. The size of the small arteries and veins in which measurements were made were of 0.5 mm. diameter.

At low rates of infusion (2-14 micrograms/min.) the arteriolar end of the distal vascular segment dilated and the venous end of the segment changed but little. At higher rates of infusion (14-150 micrograms/min.) arteriolar dilatation and small vein constriction occurred. These were inferences drawn from a study of the pressure measurements and resistance calculations. Tissue pressure was not affected in any experiment until small vein pressure was elevated to 26 mm. Hg or more for at least seven minutes. Tissue pressure did not rise until local edema was obvious. The author concludes that direct action of histamine on small veins occurs as well as the systemic effect mediated by sympathoadrenal response to histamine. He further concludes that edema formation occurs only when elevated intracapillary pressure exists.

Contributions of bicarbonate ion and of dissolved CO<sub>2</sub> to expired CO<sub>2</sub> in dogs. Chinard, F. P.; T. Enns, and M. F. Nolan. p. 78.

Regional differences in capillary permeability. Mayerson, H. S.; C. G. Wolfram; H. H. Shirley, Jr., and K. Wasserman. p. 155.

Movement of electrolytes across the wall of the urinary bladder in dogs. Rapoport, A.; T. F. Nicholson, and E. R. Yendt. p. 191.





**AMERICAN JOURNAL OF PHYSIOLOGY. Vol. 198, Mar. 1960.****◇ Regulation of Shivering and Non-Shivering Heat Production During Acclimation of Rats. T. R. A. Davis; D. R. Johnston; F. C. Bell, and B. J. Cremer. pp. 471-475.**

Sprague Dawley rats were acclimated to cold at environmental temperatures of 2 C, 6 C and 13 C. During the seven weeks acclimatization shivering, oxygen consumption, and in vitro O<sub>2</sub> uptake of muscle were measured. Also, periodically, during the experimental period the oxygen consumption was measured after administration of curare both with and without diathermy treatment. Skin and rectal temperatures during diathermy treatment showed that core temperatures were affected while skin temperature was not.

Shivering fell during cold acclimation and was virtually eliminated after 40 days exposure. Concurrently the O<sub>2</sub> consumption during curarization increased to reach the cold induced levels in about the same period, 40 days. The oxygen consumption of rats during treatment with diathermy and curare paralleled that of those treated only with curare but at a 50 per cent lower level. During the period of acclimation the in vitro O<sub>2</sub> uptake of muscle first went up to reach a peak after three days exposure. It then fell closer to pre-exposure levels at five days exposure and thereafter rose to reach a nearly stable level after about 20 days exposure. The authors interpret these and previous data to indicate: (1) central and peripheral cold induced heat production are separate entities, (2) a peripherally regulated heat production not due to shivering develops in the cold acclimated rat. They suggest that this latter may be a non-contractile activity of skeletal muscle.

**◇ Tension Response of Mammalian Muscle to Intra-Arterial Acetylcholine. P. T. Rowley; J. B. Wells, and R. L. Irwin. pp. 507-510.**

Earlier work on the contractile response of muscle to intravascular injections of acetylcholine has shown that repetitive electrical activity is produced. However, quantitation of the response and the conditions under which reproducible response was obtained have not been studied. These were the objects of the current work. The anterior tibialis muscle of cats was used. The supplying artery was cannulated and provision made to facilitate repeated rapid injections of small quantities of a solution containing acetylcholine. Isometric tension of the muscle at normal rest length was observed. In general the response is that of a non-synchronous contraction of the muscle fibers. The tension developed can exceed that developed in response to supramaximal electrical stimulation of the nerve. The tension is developed more slowly and relaxes more slowly than in the case of electrical stimulation. As long as mechanical injury to the arterial tree is avoided by restricting the volume of the injected dose and the speed of injection repeated reproducible response may be obtained. The response is proportional to the dose and to the speed of injection. This non-electrical means of producing muscular contraction could be a valuable experimental tool.

**Thermoregulatory responses to hypothalamic cooling in unanesthetized dog. Hammel, H. T.; J. D. Hardy, and M. M. Fusco. p. 481.**

**Mechanism of acute erythrocyte loss following burn. Gilmore, J. P., and H. A. Gozzard. p. 487.**

**Mechanisms leading to lung edema in pulmonary embolization. Kabins, S. A.; J. Fridman; J. Neustadt; G. Espinosa, and L. N. Katz. p. 543.**

**AMERICAN JOURNAL OF ROENTGENOLOGY. Vol. 83, Jan. 1960.****◇ Radiation Myelitis. J. B. Dynes and M. I. Smedal. pp. 78-87.**

Ten cases of radiation myelitis after radiation therapy for malignant disease were presented. The factors of importance in the development of myelitis would seem to be the dosage of radiation (more than 4000 r), the rate or intensity of application, and shielding or the failure to shield the cord, plus a very important individual sensitivity factor, about which little is known.

Five of these patients still are living; three men are paraplegic, one and a half to seven and one-half years later, and two women have spasticity with some incapacitation twenty-one months to two years later.

These patients were treated using two million volt roentgen therapy. Approximately 800 patients with malignant disease of the head, neck, mediastinum or lungs were treated with 2 mev. roentgen rays in doses ranging from 4,800 to 6,000 r, and the cervical or dorsal cord or both, have unavoidably received this same dosage.

◇ **An Investigation of the Late Clinical Findings Following Thorotrast (Thorium Dioxide) Administration.** W. B. Looney. pp. 163-185.

Thorotrast was first employed clinically in 1928. During the period 1930-1945 it was widely used in diagnostic radiology, primarily for the visualization of the liver, spleen and cerebral arteries. Its utilization has been curtailed in part because of sequelae which have developed from induration at sites of injection and in part because of the recognition that thorium, the parent of a series of radioactive daughter elements, might produce clinical damage or neoplasia.

The status of 35 patients who received thorotrast has been determined. There were relatively few deleterious effects directly attributable to thorotrast in these patients. The reports of the deleterious effects of thorotrast, since its first use in 1928, have been few.

The occurrence of one, and presumably two, rare hepatic tumors of mesodermal origin in this series of 35 patients and the reports of nine additional tumors in the literature indicate that a relationship exists between thorotrast administration and hepatic tumor induction in man. It would seem that these hepatic tumors will emerge as the predominant tumor in thorotrast patients, as bone tumors have emerged as the predominant tumor in the luminous dial workers and people who have received radium medically.

**Localization of intracranial lesions by radioactive isotopes (D.I.F.) (RISA).** Magalotti, M. F., and I. F. Hummon. p. 135.

**The use of cadmium sulfide crystals for the measurement of roentgen radiation.** St. John, E. G., and E. Fish. p. 156.



**AMERICAN JOURNAL OF ROENTGENOLOGY. Vol. 83, Feb. 1960.**

◇ **Pathognomonic Signs of Chronic Bronchitis.** V. S. Oliva; C. G. Spradley, and S. F. Williams. pp. 274-278.

Clinically, the diagnosis of chronic bronchitis is made on the basis of cough, excessive production of sputum, dyspnea and exclusion of other possibilities. Cigarette smoking is suggested as a contributing factor in its pathogenesis. The diagnosis is made by demonstrating bronchial gland dilatation and bronchiolectasis by bronchography. Bronchiolectasis is a term referring to (spheric) cystic changes of the bronchioles usually in the upper lobe bronchi as contrasted to sacular bronchiectasis usually in the lower lobes. Bronchiolectasis is an uncommon bronchographic finding, which may be due to the narrow diverticular neck making retrograde filling with contrast material difficult. Bronchiectasis is said not to be found in cases of bronchiolectasis. Bronchial gland dilatation (bronchial adenoelectasis) and bronchiolectasis (bronchiolar diverticulosis) are considered pathognomonic of chronic bronchitis in cases where bronchography is performed.

◇ **Dilatation of the Aortic Sinuses in the Marfan Syndrome: Roentgen Findings in Five New Cases.** I. Steinberg. pp. 302-319.

Angiocardiography by visualizing the thoracic aorta provides the definitive method of demonstrating the aortic sinuses.

Dilatation of the aortic sinus is probably not uncommon in Marfan's syndrome. Nine of 15 cases with Marfan's syndrome were shown to have uniform dilatations of the aortic sinuses (of Valsalva). In one, the aortic sinus dilatation was aneurysmal and was associated with huge dilatation of the ascending aorta. In over one half of the cases in a series of 10, cardiac murmurs and enlargement of the heart were the presenting findings. Angiocardiography, by demonstrating aortic sinus dilatation, revealed the cardiovascular abnormality and in some instances provided the clue that linked the associated skeletal and ocular deformities.

Marfan's syndrome is probably not so rare as previously supposed. The radiologist by noting the unusually long and thin extremities, especially the fingers and toes, thoracic deformities and cardiovascular abnormalities may be the first to suggest the diagnosis, and thereby explain seemingly unrelated findings. The forme fruste may manifest itself by aneurysmal dilatation of the aortic sinuses or ascending aorta.

**Bronchiolar ectasia: a report of twelve cases.** Sturtevant, H. N., and H. W. Knudson. p. 279.

**Selective bronchography.** Bessler, W. T., and R. R. Renner. p. 297.

**Transsternal phlebography of the internal mammary veins (in diagnosis of breast cancer).** Chiappa, S.; G. C. De Yoldi, and M. Magri. p. 320.

**The impact of rapid automatic film processing on a department of radiology.** Pirkey, E. L. p. 369.

**Idiopathic pulmonary hemosiderosis in adults: report of a case and review of the literature.** Bronson, S. M. p. 260.



### AMERICAN JOURNAL OF ROENTGENOLOGY. Vol. 83, Mar. 1960.

◇ **Chronic Radium Poisoning in a Dial Painter; Case Report.** J. A. Glenn, Jr.; J. Galindo, and C. E. Lawrence. pp. 465-473.

The case of a 57-year-old female who was exposed to radioactive material for a period of 14 months while working as a dial painter in a watch factory in New Jersey during 1917-1918, is described. During the following 39 years she survived and suffered multiple pathological fractures, many of which failed to heal; osteomyelitis of the mandible; mastoiditis and a generalized radiation osteitis. She died of carcinoma of the sphenoidal sinus which produced total blindness and accounted for intractable headaches the last four years of her illness. In 1955 right carotid angiography was read as normal and the patient was subjected to prefrontal leukotomy for narcotic resistant headaches. The carcinoma was considered a late effect of the prolonged radioactivity. Alpha radiation accounts for 95 per cent of the damage to the body in cases of ingestion of radioactive materials, whereas it is gamma radiation in ordinary radiation therapy that effects the body. The time of exposure is of great importance in the prognosis of any given case. Sarcomatous degeneration of bone which is the most common late effect did not develop in this case, although it was suspected as the cause of several of the pathologic fractures.

◇ **Radiation Exposure of Non-radiologic Hospital Personnel During Treatment of Patients.** C. E. Nurnberger. pp. 507-513.

The problem considered in this article is radiation exposure to personnel, visitors and nonradioisotope patients by radioisotope patients after radioisotopes are administered and the patients returned to their rooms. It was emphasized that the hazard with radium may exceed the hazard associated with induced radioisotopes because of the extreme care associated with the latter, although the degree of hazard in a patient's room increased in the following order: Au<sup>198</sup>, Ra<sup>226</sup>, and Co<sup>60</sup> when identical millicuries were used. It was shown for example, 50 millicuries of Co<sup>60</sup> in the pelvis of a patient could deliver gamma rays at the rate of 25 mr per hour to a patient in an adjoining room and in two days this could amount to 1200 mr which exceeds the maximum permissible yearly accumulated dose for non-occupational exposure. A permissible dose for nurses and other ward personnel was estimated as 230 mr of total body per week in any 13 consecutive weeks, but the total accumulated dose per year should not exceed 5,000 mr. The National Committee on Radiation Protection recommends a maximum permissible accumulated dose of 500 mr in any one year for "non-occupational" personnel such as the hypothetical "next door" patient mentioned.

**The moving-strip technique in the roentgen treatment of carcinoma of the breast.** Batley, F., and A. F. Halloway. p. 533.

**Radiation therapy of benign conditions.** Cooper, G., Jr. p. 538.

**Problems in the prognosis of neuroblastoma.** Dargeon, H. W. p. 551.

**Psychiatric problems in patients undergoing radiation therapy.** Ashbury, H. H. p. 571.



### AMERICAN JOURNAL OF ROENTGENOLOGY. Vol. 83, April, 1960.

◇ **The Classification of Cervical Spine Injuries.** J. E. Whitley, and H. F. Forsyth. pp. 633-644.

Classification of cervical spine injuries is based on the dynamics of injury and an attempt is made to correlate the clinical, roentgenographic and pathologic findings in each case. Broadly the injuries are divided into flexion and extension injuries with and without compression. Compression injuries are further subdivided into bilateral and unilateral, with and without ligament breaks. Further categories are combined flexion and extension injuries, Jefferson's bursting fracture of C-1 and direct trauma.

The most important single aim in the examination of a patient with a neck injury is to prevent further damage. This is accomplished at Bowman Gray by a cooperative effort of the orthopedic, neurosurgical and radiologic departments.

All cases are placed on a stretcher in the emergency room with straight line traction, five to seven pounds of halter traction if there are no neurologic signs and 10 to 20 pounds of Crutchfield traction if there are neurologic signs. A lateral view is first taken. Every effort is made to determine the mechanism of injury. Then various other views are taken to correlate the clinical symptomatology and the bony and soft tissue trauma. These matters are of vital importance in the handling of the patient, getting proper views and in instituting therapy. For example if an extension injury is mistaken for a flexion injury and the neck is manipulated with hyperextension to get extension views or to correct the deformity; the most dire consequences may follow. If present, unilateral neurologic signs are very significant. Flexion without compression is far worse than flexion with compression and extension with compression far worse than extension without compression, neurologically speaking in this series of 159 cases.

◇ **The Skull in Hyperparathyroid Bone Disease.** K. Ellis and R. J. Hochstein. pp. 732-742.

A total of 69 cases of primary hyperparathyroidism is discussed. Four cases had neither bone nor renal disease and 27 had renal disease only. In these 31 cases confirmation was mainly by serum calcium and phosphorus since the alkaline phosphatase was rarely over 5.0 Bodansky units either in those non-bony cases.

The roentgenographic findings in the calvarium of the remaining 38 cases with bone and renal or bone disease only were discussed. Typically the calvarium has characteristic homogeneous ground glass or mottled granular patterns of decreased density. In two-thirds of these patients the diagnosis of hyperparathyroid bone disease could be suggested on the basis of the skull films alone. In retrospect nearly all cases showed some involvement of the calvarium.

Differential considerations include osteomalacia, osteoporosis of Cushing's disease, senile osteoporosis, multiple myeloma, radium poisoning and hypervitaminosis D, but the characteristic blood chemical findings, changes in other bones and the clinical history will nearly always obviously distinguish cases of hyperparathyroid bone disease. Paget's disease of the skull should always have serum alkaline phosphatase before ruling out hyperparathyroidism.

**A study of the roentgen appearance of cranial vault sutures: correlation with their anatomy.** Christensen, J. B.; E. Lachman, and A. M. Brues. p. 615.

**The weight force in charcot disease of joints: the apparent paradox of tibiofibular joint fusion.** Burman, M. p. 663.

**Skeletal metastases from malignant testicular tumors. A report of 10 cases with osteolytic and osteoblastic changes.** Sum, P. W.; B. Roswit, and S. M. Unger. p. 704.

**Osteoblastic bone metastasis in gastrointestinal and bronchial carcinoids.** Toomey, F. B., and B. Felson. p. 709.

**Primary hyperparathyroidism.** Teng, C. T., and M. H. Nathan. p. 716.

**Advanced skeletal changes in hyperparathyroidism.** Friedenbergh, R. M., and V. Sayegh. p. 743.



## GERIATRICS. Vol. 15, Jan. 1960.

**Recent developments in research on cancer.** Heller, J. R. p. 1.

**Epilepsy in the aging and aged.** Schwade, E. D. p. 11.

**Age and outstanding achievement in creative chemistry.** Lehman, H. C. p. 19.

**Effect of T-3 on the senile state: a double blind evaluation of 1-Triiodothyronine (Cytomel R) in the management of institutionalized geriatric patients.** Darvill, F. T., Jr. p. 38.

**Psychologic and osteometabolic responses to sex hormones in elderly osteoporotic women.** Solomon, G. F.; W. J. Dickerson, and E. Eisenberg. p. 46.

**Clinicopathological conference: Minneapolis Veterans Hospital.** Hoffbauer, F. W.; H. H. Zinneman, and P. F. Bowlin. p. 61.



**GERIATRICS. Vol. 15, Feb. 1960.**

- Surgery for abdominal emergencies. *Ryan, P.* p. 73.
- Postoperative management of bladder carcinoma. *Persky, L.; S. Levey, and W. E. Abbott.* p. 90.
- Psychoneurotic reactions of the aged. *Busse, E. W.; R. H. Dovenmuehle, and R. G. Brown.* p. 97.
- Care of hearing in the elderly. *Hoople, G. D.* p. 106.
- The Sacramento street project. *Conant, J. E.* p. 110.
- Acute parotitis in the aged. *Liu, S. F., and N. A. Page.* p. 115.
- Personality factors in adjustment to aging. *Peck, R. F.* p. 124.
- Agromegaly with heart disease. *Goldner, M. G., and B. Wainfeld.* p. 131.

**GERIATRICS. Vol. 15, Mar. 1960.**

- ◇ Simon Baruch, Pioneer in the Physical Rehabilitation of the Geriatric Patient. *F. H. Krusen.* pp. 176-179.

An immigrant to America in 1855, Dr. Simon Baruch (1840-1921) was educated in South Carolina and, later, at the Medical College of Virginia. After serving with General Lee's troops during the Civil War, he built a successful practice in South Carolina and later practiced in New York.

An interest in therapeutic effects of water led to fame as an international authority on hydrotherapy. Also concerned with problems of rehabilitation of the aged, he served as one of the early pioneers in this field.

In 1943, Bernard Baruch, famous philanthropist and elder statesman, established the Baruch Committee on Physical Medicine and Rehabilitation, thus perpetuating the work of his father.

- ◇ Spondylolysis in the Aged. *H. Nathan; I. Alkalaj, and I. Aviad.* pp. 187-196.

One hundred and twenty-five unselected old people over the age of 65 years were examined by radiologic means for evidence of spondylolysis. Fifteen cases were identified, representing an incidence of 12 per cent. This is higher than the generally accepted frequency of 5 per cent for white people.

Among the cases free of spondylolysis, many showed prespondylolysis represented by thinning of the vertebral isthmus with notching of its upper and lower surfaces. This is to be distinguished from spondylolysis in which there is complete interruption of bony continuity of the isthmus. Other authors' observations on the frequency of spondylolysis at different ages show an increase of the disease with age. The results of this study support such a concept. This may be explained by the theory of development of spondylolysis by compression of the isthmuses by the articular processes of the vertebrae above and below them. Factors of aging influencing the process include flattening of the vertebral bodies, thinning of the intervertebral disks and weakening of the isthmus as a result of osteoporosis.

- Turn backward, oh time. *Terrien, F. W.* p. 145.
- Subacute bacterial endocarditis in old persons. *Gleckler, W. J.* p. 152.
- Additives to combat side effects of reserpine. *Feinblatt, T. M.* p. 158.
- Ulcerative colitis in older-age patients. *Bercovitz, Z. T.* p. 164.
- Method for gastric tube feeding with brief review of peptic esophagitis. *Capper, R. S.; J. P. Darby, Jr., and E. H. Picard.* p. 172.
- The Montefiore home hearing conservation program. *Heffler, A. J.* p. 180.
- Clinicopathologic conference: Minneapolis Veterans Hospital. *Lillehei, J. P.; H. H. Zinneman, and P. F. Bowlin.* p. 197.
- Otitis media in aging albino rats. *Retzlaff, E.; S. Rogols, and B. Pasamanick.* p. 205.
- AAAS symposium on aging. *Leake, C. D.* p. 210.





**GERIATRICS. Vol. 15, April 1960.**

◇ **Design for a Study of Geriatric Rehabilitation.** W. Donahue, and J. W. Rae, Jr. pp. 229-232.

An evaluation of geriatric patients in three county hospitals in Michigan was made to determine the therapeutic and rehabilitation needs of each person. Two hospitals constituted experimental stations while the third served as a control.

The first phase of the study included an assessment of the physical, functional, psychosocial, and vocational status and potential of all the patients. Next, an experimental project with intensive treatment and activity programs was instituted for those in need. The third phase will be re-evaluation of all the patients treated to provide "before" and "after" data of the study. Ultimately, the experimental program will be inaugurated in the control hospital to be followed later by a full report of the complete study including recommendations for a practical rehabilitation program in a geriatric setting.

◇ **Medical Care Needs and Rehabilitation Potential.** E. M. Smith; R. L. Brandt, and R. D. Currier. pp. 296-305.

A survey of geriatric patients in two county hospitals in Michigan suggested the need for different types of treatment and care programs. An evaluation of the medical and functional status of 125 geriatric patients revealed varied care needs which could be met through three basic types of programs: (1) active treatment, (2) maintenance nursing, and (3) supervisory care.

The active treatment program was designed for patients who could receive significant benefit from treatment, and included two categories: long-term medical treatment and physical restorative care. Over 70 per cent of this group had disorders of the nervous system, with musculoskeletal disease and cardiovascular illness also important subgroups.

The maintenance nursing program was for patients in need of nursing or personal care service who were not expected to improve significantly with long-term medical or restorative care. In this group the goal was to preserve existing levels of health and independence as long as possible.

The supervisory care program was for patients unable to manage their affairs independently, even though physically independent and not in need of special medical or nursing care. An attempt was made to establish as normal living patterns as possible for this group.

The existence of such separate groups implies the need of establishing suitable means of screening patients and segregating them into appropriate care groups.

**Michigan report — introduction.** Donahue, W. p. 221.

**Gerontology at the University of Michigan — the historical perspective.** Donahue, W. p. 222.

**Medical appraisal of elderly county hospital patients.** Brandt, R. L., and C. J. Tupper. p. 233.

**Neurologic findings in county hospital patients.** Currier, R. D. p. 254.

**Rehabilitation of geriatric patients in county hospitals — A preliminary report.** Donahue, W.; W. W. Hunter; D. Coons, and H. Maurice. p. 263.

**Michigan survey of geriatric nursing facilities.** Winter, K. E. p. 275.

**Communication problems among aged county hospital patients.** Bloomer, H. H. p. 291.

**Dental conditions of county hospital patients.** Di Napoli, A.; R. H. Kingery, and P. Gibbons. p. 306.

**Decreased carbohydrate tolerance in elderly patients.** Brandt, R. L. p. 315.

**JOURNAL OF APPLIED PHYSIOLOGY. Vol. 15, Jan. 1960.**

◇ **Ulnar Nerve Conduction Velocity and H-Reflex in Infants and Children.** J. E. Thomas, and E. H. Lambert. pp. 1-9.

Measurements were made of the conduction velocity of the ulnar nerve in the forearm of six premature infants, 42 full term infants, and 98 children through 14 years of age. In premature infants the mean conduction velocity was 21 meters per second. Full term new born infants



had mean velocities of 28 meters per second. By five years of age the children's conduction velocities were not significantly different from adults which range from 47 to 73 meters per second. At five years nerve maturation has been completed.

A latency of response to stimulation of the ulnar nerve at the wrist was found which measures 1.2 msec. in infants and 1.6 msec. in adults. This residual latency might be accounted for by slowing of conduction in the fine nerve terminals and delay in the neuromuscular junction.

The H-reflex could be elicited by stimulation of the ulnar nerve in almost every newborn infant. This disappeared by the age of one year. In the forearm, afferent fibers subserving this reflex conducted with a mean velocity of 30 meters per second. The H-reflex, like the Babinski, is probably an expression of the immaturity of the nervous system and can be attributed to lack of central mechanisms of suppression.

◇ **Effects of a Short Period of Training of Varying Severity on Some Measurements of Physical Fitness.** J. V. G. A. Durnin; J. M. Brockway, and H. W. Whitcher. pp. 161-165.

This is a controlled study of 44 untrained young men doing sub-maximal exercise over a short period of time. The men were divided into four groups; one group acted as controls while the other groups walked 10 km., 20 km., and 30 km. each day respectively for two five-day periods with a two-day rest between periods.

To determine the effects of training, pulmonary ventilation, oxygen extraction of the pulmonary air, and oxygen consumption were measured while the subject walked on a treadmill. Heart rate during treadmill walking and recovery heart rate also were measured. The only group which showed a significant training effect were the men who walked 20 km. daily. They had significantly decreased pulmonary ventilation and oxygen consumption at the termination of the study. The exercise heart rate of all groups except the control group was slower after training. The recovery heart rate was not significantly lowered one minute after the treadmill running in any group but it was lowered in the 30 km. group at two, three and four minutes after the test, and at two minutes after the test in the 20 km. group.

One inconsistency of this study was a significant lowering of the percentage of oxygen extracted from the pulmonary air in the control and 10 km. groups.

Other authors have stated that a heart rate of at least 150 per minute during exercise is necessary before a training effect can be noticed. The heart rate of the men in this study varied between 120 to 130 per minute while walking and they all showed a lowered heart rate after the training period. Since the subjects in the studies referred to exercised for only one-half hour daily, it would appear logical that within certain limits, duration of work is also of importance in achieving a training effect.

**Relation of arterial pressure to spontaneous variations in digital volume.** Burch, G. E., and N. De Pasquale, p. 23.

**Hematological changes during muscular activity and recovery.** De Lanne, R.; J. R. Barnes, and L. Brouha. p. 31.

**Adrenolytic and sympatholytic action of certain dihydrogenated ergot alkaloids (Hydergine) on dog kidney.** Kubicek, W. G. p. 109.

**Obesity, age and gastric hunger contractions.** Koch, C. R., and A. J. Stunkard. p. 133.



## JOURNAL OF APPLIED PHYSIOLOGY. Vol. 15, Mar. 1960.

◇ **Caloric Expenditure of Normal and Obese Subjects During Standard Work Tests.** W. P. McKee, and R. E. Bolinger. pp. 197-200.

The energy expenditure of 25 normal and 19 obese persons was determined during the basal state and during a standard work test using weight pulling by the counter balanced right arm. The tests consisted of pulling and releasing a weight at the rate of 30 times a minute for a period of five minutes.

The caloric expenditure in obese persons during the basal state is significantly greater than normal and is related to the increase in surface area with increasing obesity. The increment of caloric expenditure when corrected for surface area was no different in female subjects, however, the obese males had significantly lower values than their non-obese controls. The total energy expenditure during the work period was significantly higher in the obese men and women which was due entirely to the increased surface area. Males show consistently less energy expenditure than females indicating more efficient performance.

These findings show there is no deviation from normal in the work efficiency of obese persons as performed by an "untrained" muscle group and that both obese and non-obese females are less efficient than their male counterparts.

◇ **Effect of Exercise, Immobilization and Intermittent Stretching on Strength of Knee Ligaments of Albino Rats.** P. J. Rasch; R. Maniscalco; W. R. Peirson, and G. A. Logan. pp. 289-290.

Sixty male albino rats were divided into four groups; the rats in the first group ran in an exercise drum for 15 minutes twice daily at 0.5 mph for 10 days, then 1 mph for 10 days. The right rear leg of the rats in the second group was stretched by suspension of a 7 oz. weight for one minute, followed by one minute rest, for a total of 10 minutes twice daily. An additional ounce was added at the start of each week. The right hind limb of the third group was immobilized by fixation through the abdominal wall. The fourth group served as controls.

At the end of four weeks all animals were sacrificed and the muscle tissue was dissected from the hind legs. The amount of weight required to completely tear the knee ligaments was determined.

No significant difference was found in the tensile strength of the knee ligaments in all groups. The authors concluded that running and stretching did not strengthen or weaken the knee ligaments in rats.

**Correlation of heat output in blood flow in the finger, especially in cold induced vasodilatation.** Edwards, M., and A. Burton. p. 201.

**Breath holding during and after musculature exercise.** Astrand, O. p. 220.

**Changes in foot volume and capillary fragility during continuous cold exposure and starvation.** Norman, P. S.; M. D. Kreider, and P. F. Iamtiemo. p. 261.

**Tongue, hyoid and larynx displacement in swallow and phonation.** Shelton, R. L., Jr.; J. F. Bosma, and B. Sheets. p. 283.

**An E.K.G. lead for exercising subjects.** Gedders, L. A.; M. Partridge, and H. E. Hoff. p. 311.

**Application of a photoconductive cell to the study of peripheral circulation in limbs of animals and man.** Winman, J.; C. Bicher, and D. Levy. p. 317.



## JOURNAL OF CHRONIC DISEASES. Vol. 11, Feb. 1960.

◇ **A Critical Review of Some Published Experiments With Chlorpromazine in Schizophrenic, Neurotic, and Normal Humans.** Fred Heilizer. pp. 102-148.

This paper is an attempt to evaluate the data concerning the use of chlorpromazine in schizophrenic patients according to certain criteria of scientific investigation. The article is divided into three sections: review of the literature; implicit methodologic factors; and discussion. There were 29 investigations on psychotic subjects, four on neurotic subjects and two on normal subjects. The general conclusion was that chlorpromazine had a salutary effect upon psychotic subjects but no effect upon neurotic subjects. Normal subjects suffered from impaired function as the drug dosage level increased.

The author found that few studies met minimum standards of scientific evaluation. There was a great deal of variability in the use of statistics, type of evaluation, dosage standards, the way medication was dispensed, choice of patients, and sex of patients.

The author concluded that there is basically a schism between the philosophy of the clinician and the scientist but at the same time held out a hope that each could learn from the other. He could not refrain from mentioning that in his opinion, clinical investigators have not assimilated basic scientific standards.

◇ **The Relationship of Tetanus to Chronic Skin Ulcers and Diabetes Mellitus.** Michael J. Takos, and A. William Menzin. pp. 170-175.

The purpose of this study is to direct the attention of medical practitioners to the susceptibility of patients with chronic skin ulcers or diabetes mellitus to tetanus.

Diabetics and patients with chronic skin ulcers, especially those over the age of 40, constitute high-risk groups. Immunization with tetanus toxoid is both practical and logical. Even though tetanus is a rare disease, it carries a high case fatality rate. Consequently every person in the

high-risk groups should be immunized by two injections of toxoid one month apart, and a booster dose after the second injection. Booster doses every three years thereafter would maintain high levels of immunity.

**The stethoscope: A source of diagnostic aid and conceptual errors in rheumatic heart disease.** *Feinstein, Alvan R. p. 91.*

**Clinical social work planning with 5,000 general medical and surgical patients for their hospital discharge.** *Moncure, Claribel H. p. 176.*



## JOURNAL OF CHRONIC DISEASES. Vol. 11, Mar. 1960.

◇ **Physiologic and Clinical Aspects of Magnesium Metabolism.** Earl S. Barker. pp. 278-291.

Magnesium plays an important role in the body economy. It is a principal cation of intracellular, and to some extent extracellular fluid, and is an activator in a great number of enzymatic reactions essential to metabolism. Its most notable pharmacologic action is depression of the nervous and cardiovascular systems.

Clinical disturbances in magnesium metabolism are difficult to assess because of lack of accurate analytic methods. Magnesium exists in several forms in the body including a protein-bound fraction.

Magnesium deficiency is associated with chronic alcoholism and delirium tremens, prolonged parenteral fluid treatment, and diabetic acidosis during insulin and fluid therapy. Symptoms may be tetany, twitching, agitation, delirium, or psychotic behavior. Parenteral magnesium therapy is of benefit.

Magnesium excess produces drowsiness, loss of deep tendon reflexes, prolonged P-R interval, and in severe cases coma and hypotension. This condition is seen most often in acute and chronic renal failure with oliguria. Calcium salts and dialysis have been beneficial in treatment.

**Aldosterone in Fluid and Electrolyte Disorders: Hyper- and Hypoaldosteronism.** John H. Laragh. pp. 292-318.

Aldosterone has a direct effect on the renal tubule and consequently plays a major role in regulating the amount of potassium and sodium in the body. Hypersecretion in otherwise normal subjects results in hypertension and potassium depletion. In the edematous states of cirrhosis and nephrosis hypersecretion of aldosterone produces sustained renal retention of sodium without hypertension or potassium depletion. In advanced congestive failure hypersecretion may not occur.

Aldosterone secretion is related to potassium balance, changes in blood volume, and perhaps to ACTH. It may be that pressure changes in the vascular tree also play a role.

Malignant hypertension is often associated with hypersecretion of aldosterone. Whether aldosterone is responsible for this disease is unknown. In benign hypertension secretion of aldosterone is normal. Aldosterone secretion may be important in hypotension, sodium and water depletion, and potassium accumulation. Hypoaldosteronism may be difficult to identify clinically.

**The problem of sodium and water needs of patients.** *Burnell, James M.; Richard R. Paton, and Belding H. Scribner. p. 189.*

**Polyuria.** *de Wardener, H. E. p. 199.*

**The consequences of potassium depletion.** *Welt, L. B.; W. Hollander, Jr., and W. B. Blythe. p. 213.*

**Calcium and the kidney.** *Epstein, Franklin H. p. 255.*

**Electrolyte disorders in chronic renal disease.** *Schwartz, William B., and Adolf Polak. p. 319.*

**Symptoms and signs in disorders of body fluid.** *Black, D. A. K. p. 340.*



**JOURNAL OF NEUROPATHOLOGY  
AND EXPERIMENTAL NEUROLOGY. Vol. 2, April 1960.**

◇ **The Effect of Cooling on Mammalian Muscle Spindles.** Earl Eldred; David F. Lindsley, and Jennifer S. Buchwald. pp. 144-157.

The use of cold is not infrequently recommended to reduce spasticity. The rationale for its use is further provided and supported by this very interesting report.

The authors have investigated the effects of gradual cooling on discharge from sensory receptors in the gastrocnemius muscle of the cat. The effect of changes in volume of inflow from the several types of endings on central motor excitability has also been studied. Sensory units of the muscle were identified as tendon organs or muscle spindles by their response during a twitch and distinction of annulospiral and flower-spray afferents was made on the basis of conduction rates.

Either the entire muscle or the vicinity only of individual sensory organs was cooled 10 to 15 C. below normal body temperature. Annulospiral, flower-spray, and tendon organ endings under tension all fired slowly when cooled, with greater absolute decreases at higher tensions. Absolute decreases for the three types were roughly similar and generally lied between 10 and 30 pulses per second for a 10 C. drop. Relative to control rates, annulospiral endings were probably more sensitive to cooling than flower-spray ones.

The decline in sensory discharge may lead in turn to modification of motor response. This activity was indeed reduced judging by two indices of extensor function: the monosynaptic reflex and decerebrate rigidity.

Reduction in height of the monosynaptic response to stimulation of the lateral gastrocnemius nerve was invariably found upon cooling of the medial gastrocnemius muscle. This effect can be fairly large, for with the stimulus initially adjusted to yield a response 75 per cent maximal, the reflex almost disappeared with 10 C. of cooling. Decerebrate rigidity in the triceps surae muscle also decreased with cooling.

Indirect effects of the alterations in afferent input on supraspinal centers of motor influence, of course, could not be excluded.

**Some uses of computers in experimental neurology.** Brazier, Mary A. B. p. 123.



### IMPORTANT NOTICE TO CONGRESS MEMBERS

Please take notice the following amendments to the Constitution and By-Laws of the American Congress of Physical Medicine and Rehabilitation will be presented to the general membership for acceptance or rejection at the annual business session, The Mayflower, August 24 and August 26, 1960.

## CONSTITUTION OF THE AMERICAN CONGRESS OF PHYSICAL MEDICINE AND REHABILITATION

### ARTICLE III — MEMBERSHIP

*Section 1. Classes of Members.* This organization consists of

- (a) Active Members
- (b) Associate Members
- (c) Honorary Members
- (d) Affiliate Members

*Section 2. Qualifications.* The qualifications stated below with respect to each class of membership noted are prerequisites for eligibility for the class stated:

(a) To be an Active Member a person must be:

(1) A graduate in medicine and surgery, legally qualified to practice medicine and surgery in some state or territory, or in the District of Columbia or in some foreign country.

(2) Elected to such membership in accordance with the applicable provisions of the By-Laws.

(b) To be an Associate Member, a person shall be a physiologist, physicist, biophysicist, electrical engineer, mechanical engineer, chemical engineer, research worker, investigator, teacher, or any other expert in the field of physical medicine and rehabilitation and shall be invited by the Membership Committee.

(c) To be an Honorary Member a person shall be an eminent person interested in physical medicine and rehabilitation and shall be invited by the Membership Committee or shall be a holder of the Gold Key.

(d) To be an Affiliate Member, a person shall be actively enrolled in an approved residency or fellowship in physical medicine and rehabilitation.

**Amend Article III, to read as follows:**

*Section 1. Classes of Members.* This organization consists of

- (a) Active Members
- (b) Associate Members
- (c) Honorary Members
- (d) Affiliate Members
- (e) Corresponding Members

*Section 2. Qualifications.* The qualifications stated below with respect to each class of membership noted are prerequisites for eligibility for the class stated:

(a) To be an Active Member a person must be:

(1) A graduate in medicine and surgery, legally qualified to practice medicine and surgery in some state or territory, or in the District of Columbia or in some foreign country.

(2) Elected to such membership in accordance with the applicable provisions of the By-Laws.

(b) To be an Associate Member, a person shall be a physiologist, physicist, biophysicist, electrical engineer, mechanical engineer, chemical engineer, research worker, investigator, teacher or any other expert in the field of physical medicine and rehabilitation and shall be invited by the Membership Committee.

(c) To be an Honorary Member a person shall be an eminent person interested in physical medicine and rehabilitation and shall be invited by the Membership Committee or shall be a holder of the Gold Key.

(d) To be an Affiliate Member, a person shall be actively enrolled in an approved residency or fellowship in physical medicine and rehabilitation.

(e) To be a Corresponding Member, a person shall be a doctor of medicine who is a member in good standing of a foreign physical medicine society and who is also a member in good standing of the International Federation of Physical Medicine.

#### ARTICLE VI — ELECTIONS

At the regular business meeting the Nominating Committee shall present to the organization nominations for all offices except that of President for election to succeed officers whose terms will expire at the annual session. At a regular business meeting the voting members shall elect from among such nominations and from among such nominations as may be made from the floor at that meeting. A vote of the majority of voting members present and voting shall be necessary to elect.

##### **Amend Article VI, to read as follows:**

At the regular business meeting the Nominating Committee shall present to the organization nominations for all offices except that of President for election to succeed officers whose terms will expire at the end of the annual session. At a regular business meeting the voting members shall elect from among such nominations and from among such nominations as may be made from the floor at that meeting. A vote of the majority of voting members present and voting shall be necessary to elect.

#### ARTICLE VII — EXECUTIVE COUNCIL

*Section 1. Composition.* The Executive Council shall consist of all the Past-Presidents of the Congress and the Chairman each year shall be the newest member.

*Section 2. Powers.* This Council shall be a supervisory body available for aid or advice to any of the officers or committees of the organization.

*Section 3. Meetings.* This Council shall meet at least once during the annual session and at such other times as may be required.

##### **Amend Article VII, Section 1, to read as follows:**

*Section 1. Composition.* The Executive Council shall consist of all the past presidents of the Congress. The officers shall consist of a chairman and a secretary. The chairman shall be the immediate past president of the Congress. The secretary shall be the immediate past chairman of the Executive Council. Vacancies created by death, resignation, removal, disqualification or the absence of an officer at a stated meeting of the Executive Council shall be filled by succession in the order of the most recent occupant of the office.

#### ARTICLE VIII — AMERICAN REGISTRY OF PHYSICAL THERAPISTS

*Section 1. Relation to the Organization.* This organization shall operate a Registry for the purpose of maintaining a list of physical therapists competent and qualified to administer adequate physical therapy under the specific prescription and direct supervision of licensed physicians.

##### **Amend Article VIII, Section 1, to read as follows:**

*Section 1. Relation to the Organization.* This organization shall sponsor a Registry for the purpose of maintaining a list of physical therapists competent and qualified to administer adequate physical therapy under the specific prescription and direct supervision of licensed physicians.



## ARTICLE X — OFFICIAL PUBLICATION

*Section 1. Name.* The official publication of the Congress is the ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION, in which shall be published all official Congress notices and transactions of the Congress, either in abstract or in full. The management of the ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION and the direction of its policies shall be vested in an Editorial Board to be constituted as provided for in the succeeding section.

*Section 2. Composition of Editorial Board.* The Editorial Board shall consist of seven members appointed by the Board of Governors, one member to serve one year, one member to serve two years, one member to serve three years, one member to serve four years, one member to serve five years, one member to serve six years, and one member to serve seven years. A member appointed for a full term shall assume office at the close of the business meeting of the Congress following his appointment. Thereafter as the term of a member of the Editorial Board expires, the Board of Governors shall appoint a successor to serve a seven year term. If a member dies, resigns or is removed, the Board shall appoint a successor to serve the unexpired portion of the term and the member so appointed to fill the unexpired term shall assume office immediately following his appointment. At the annual meeting of the Editorial Board, a chairman shall be elected by the Board to serve a term of one year beginning at the conclusion of the business meeting of the Congress following his election.

**Amend Article X, Section 2, to read as follows:**

*Section 2. Composition of Editorial Board.* The Editorial Board shall consist of seven members appointed by the Board of Governors, one member to serve one year, one member to serve two years, one member to serve three years, one member to serve four years, one member to serve five years, one member to serve six years, and one member to serve seven years. A member appointed for a full term shall assume office at the close of the business meeting of the Congress following his appointment. Thereafter as the term of a member of the Editorial Board expires, the Board of Governors shall appoint a successor to serve a seven year term. If a member dies, resigns or is removed, the Board of Governors shall appoint a successor to serve the unexpired portion of the term and the member so appointed to fill the unexpired term shall assume office immediately following his appointment. At the annual meeting of the Editorial Board, a chairman shall be elected by the Board to serve a term of one year beginning at the conclusion of the business meeting of the Congress following his election.

## ARTICLE XII — MEETINGS

The Congress shall meet at such times and places as may be indicated in the By-Laws provided there shall be held annually a meeting which shall be designated as the Annual Meeting at which the Congress shall elect members to succeed officers and committeemen whose terms expire at the beginning of the following meeting, and provided that the Board of Governors may subsequently by majority vote designate a different time and/or place accordingly as necessity, advisability or convenience may indicate. The Congress may be called into special session at any time during the year by the President on the written request of twenty-five members.

**Amend Article XII, to read as follows:**

The Congress shall meet at such times and places as may be indicated in the By-Laws provided there shall be held annually a meeting which shall be designated as the Annual Meeting at which the Congress shall elect members to succeed officers and committeemen whose terms expire at the end of the annual session, and provided that the Board of Governors may subsequently by majority vote designate a different time and/or place accordingly as necessity, advisability or convenience may indicate. The Congress may be called into special session at any time during the year by the President on the written request of twenty-five members.

## ARTICLE XIII — FINANCE

*Section 3. Supervision.* Supervision of the funds, investments, and expenditures of the Congress is vested in a Finance Committee, which shall consist of three members elected by the members of the organization for terms so staggered that in the year following the adoption of this Constitution and the By-Laws and annually thereafter the organization may elect one member for a three-year term. The Committee shall annually designate one of its members to serve as Chairman. The committee itself, or if the By-Laws so provide, jointly with such com-

mittees as may be provided in the By-Laws shall annually prepare a budget of the Congress' expenditures for the ensuing year, which shall be presented for approval at a business meeting of the annual session.

**Amend Article XIII, Section 3, to read as follows:**

*Section 3. Annual Budget.* An annual budget for the next fiscal year shall be prepared by the Executive Director and the Executive Secretary and adopted after approval by the Board of Governors.

**ARTICLE XIV — ETHICS**

The Principles of Medical Ethics of the American Medical Association in force at the time of the adoption of this Constitution and as they may from time to time thereafter be amended by the American Medical Association are the Principles of Medical Ethics of the Congress and are binding on its members.

**Amend Article XIV, to read as follows:**

*Section 1.* The Principles of Medical Ethics of the American Medical Association in force at the time of the adoption of this Constitution and as they may from time to time thereafter be amended by the American Medical Association are the Principles of Medical Ethics of the Congress and are binding on its members.

*Section 2. Ethics.* The principles of Practice of the American Congress of Physical Medicine and Rehabilitation are:

I affirm my devotion to the service of humanity and will do everything I can to merit the confidence and sacred trust of my patients. My responsibility to my patient is my first obligation.

I affirm my adherence to the "Principles of Medical Ethics" of the American Medical Association and my determination to practice the profession of medicine and the specialty of physical medicine and rehabilitation in accord with them.

I will stand ever ready to make available my skills, services, and knowledge to my colleagues and will cooperate with them so that advances in medical knowledge particularly in physical medicine and rehabilitation will be available to them and their patients.

I affirm my obligation to do my utmost to protect the profession, the specialty of physical medicine and rehabilitation, and the public against physicians deficient in moral character or professional competence.

I affirm that upon undertaking the care of a patient I shall not neglect him or discontinue my care without giving adequate notice.

I am free to choose whom I shall serve, but I will not solicit.

I will not dispose of my services under terms or conditions which hinder or impair the free and complete exercise of my independent medical judgment and skill;

cause deterioration of the quality of medical care, and

permit the sale of my services by any hospital, corporation, rehabilitation center, or lay body, by whatever name called or however organized, not licensed to practice medicine.

I will not solicit nor accept a position which is occupied by another physiatrist without first consulting with that physiatrist.

I will not divide fees for professional medical services performed by me directly or indirectly with any other person.

I will not participate, directly or indirectly, in any program contrary to law or in any program for the rendering of professional medical services which is not under the direction and supervision of a licensed doctor of medicine.

**These amendments are presented in accordance with Article XVI — Amendments:**

This Constitution may be amended in whole or in part at any annual business meeting by a two-thirds vote of all voting members present and voting provided that prior to that time the amendment

- (1) Has been presented in writing at the previous annual business meeting, and

(2) A copy of the proposed amendment, together with a notice that the matter will be voted on is sent by mail to each member or is published in the ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION not less than one month in advance of the annual business meeting at which action is to be taken.

## BY - LAWS

### CHAPTER 1 — MEMBERSHIP

#### *Section 1. How Obtained.*

(a) *Active Membership.* A candidate for active membership must present a written application, the form of which shall be as prescribed by the Membership Committee. The application shall be endorsed by one active member of this organization. The Membership Committee shall determine if the qualifications have been met as set forth in Article III of the Constitution. If found favorable the Membership Committee shall nominate the candidate for election to membership at the next business meeting of the organization. A majority of the votes of voting members present and voting shall be necessary to elect a candidate to membership.

(b) *Associate and Honorary Membership.* The nomination of associate and honorary members shall be vested in the Membership Committee subject to the approval of this organization.

*Section 2. Rights of Members.* All members in good standing shall be equally privileged to attend all meetings and take part in all proceedings but right to vote and to hold office is limited to active members. When a member resigns or loses his membership in this organization, he forfeits all rights and title to any share in the privileges and the property of this organization.

All scientific privileges of the organization shall be accorded to associate and honorary members.

#### *Section 3. Dues and Special Assessments.*

(a) The annual dues which shall be due January 1 shall be in such sum as is set by the Board of Governors. Any member whose dues are in arrears shall be dropped from membership and that member shall no longer receive the official publication. Associate members shall pay the annual dues required of active membership. Honorary members shall be exempt from dues and fees for that period. Affiliate members shall pay one-half of the annual dues required of active members.

(b) *Special Exemption from Dues.* — Any active member of the organization who has been a member in good standing for five years and has passed his sixty-fifth birthday may, on his personal application in writing to the Board of Governors, be exempted from all future dues and shall remain a voting member in good standing in the Congress. He shall receive the ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION on the payment of the current subscription rate.

Any member in good standing may qualify as a life member on the payment of five hundred (\$500.00) dollars and thereafter be exempt from dues. He may be allowed to continue his subscription as in the foregoing paragraph.

*Section 4. Good Standing.* A member is not in good standing within the meaning of the Constitution and these By-Laws:

(a) Unless in the case of an active member payment of dues on his behalf has been received;

(b) If his license to practice has been revoked and has not been subsequently restored on appeal.

#### **Amend Chapter I, to read as follows:**

##### *Section 1. How Obtained.*

(a) *Active Membership.* A candidate for active membership must present a written application, the form of which shall be as prescribed by the Membership Committee. The application shall be endorsed by one active member of this organization. The Membership Committee shall determine if the qualifications have been met as set forth in Article III of the Constitution. If found favorable the Membership Committee shall nominate the candidate for election to membership at the next business meeting of the organization. A majority of the votes of voting members present and voting shall be necessary to elect a candidate to membership.

(b) *Associate, Honorary, Affiliate and Corresponding Membership.* The nomination of associate, honorary, affiliate and corresponding members shall be vested in the Membership Committee, subject to the approval of this organization.

*Section 2. Rights of Members.* All members in good standing shall be equally privileged to attend all meetings and take part in all proceedings but right to vote and to hold office is limited to active members. When a member resigns or loses his membership in this organization, he forfeits all rights and title to any share in the privileges and the property of this organization.

All scientific privileges of the organization shall be accorded to associate and honorary members.

*Section 3. Dues and Special Assessments.*

(a) The annual dues which shall be due January 1 shall be in such sum as is set by the Board of Governors. Any member whose dues are in arrears shall be dropped from membership and that member shall no longer receive the official publication. Associate members shall pay the annual dues required of active membership. Honorary members shall be exempt from dues and fees for that period. Affiliate members shall pay one-half of the annual dues required of active members. The Board of Governors shall determine the annual dues required of corresponding members.

(b) *Special Exemption from Dues.* Any active member of the organization who has been a member in good standing for fifteen years, has passed his sixty-fifth birthday and has retired from all remunerative activities, on his personal application in writing to the Board of Governors, be exempted from all future dues and shall remain a voting member in good standing in the Congress. The Board of Governors shall have authority to exempt a dues paying member in the event such dues paying member becomes permanently and totally disabled. He shall receive the ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION on the payment of the current subscription rate.

Any member in good standing may qualify as a life member on the payment of five hundred (\$500.00) dollars and thereafter be exempt from dues. He may be allowed to continue his subscription as in the foregoing paragraph.

*Section 4. Good Standing.* A member is not in good standing within the meaning of the Constitution and these By-Laws:

(a) Unless in the case of a dues paying member payment of dues on his behalf has been received;

(b) If his license to practice has been revoked and has not been subsequently restored on appeal.

## CHAPTER II — DISCIPLINE

*Section 1. Causes.* A member may be admonished, suspended or expelled if the member has committed one or more of the following acts or if one or more of the following acts has occurred:

(a) Default in the payment of dues or special assessments;

Amend Chapter II, Section 1(a), to read as follows:

(a) Default in the payment of dues or special assessments. A dues paying member who fails to pay his dues by March 1 of the current year shall automatically be suspended as a member and shall not be accorded any of the privileges of his membership. If such delinquent member fails to pay his dues or a special assessment on or before the 15th day of December of the current year his membership shall automatically terminate as of that date. Before such membership shall be suspended or terminated such member shall be sent a letter stating that his membership shall be suspended or shall be terminated, as the case may be, in the event of his continued default.

## CHAPTER V — STANDING COMMITTEES

*Section 1. The Standing Committees.* The standing committees of the organization shall consist of the following:

- (a) Awards and Prizes
- (b) Constitution and By-Laws
- (c) Finance
- (d) Legislation

- (e) Medical Practice
- (f) Membership
- (g) Nominating
- (h) Professional Education and Development
- (i) Program
- (j) Public Relations
- (k) Specialized Hospitals and Services

**Amend Chapter V, Section 1, to read as follows:**

*Section 1. The Standing Committees.* The standing committees of the organization shall consist of the following:

- (a) Awards and Prizes
- (b) Constitution and By-Laws
- (c) Legislation
- (d) Medical Practice
- (e) Membership
- (f) Nominating
- (g) Professional Education and Development
- (h) Program
- (i) Public Relations
- (j) Specialized Hospitals and Services

**Further amend Chapter V, Section 4 by striking the same and renumbering accordingly.**

**These amendments are presented in accordance with Chapter VII — Amendments:**

These By-Laws may be amended at any regular meeting by the affirmative vote of at least two-thirds of the members present and voting, provided that the proposed amendment has been submitted in writing and has been read at a meeting of the Congress on the day previous to the day on which the amendment is adopted.



# *Important -*

to members of the

## AMERICAN ACADEMY OF PHYSICAL MEDICINE AND REHABILITATION

The Nominating Committee of the American Academy of Physical Medicine and Rehabilitation, being well aware of the obligations placed upon it and after careful consideration, unanimously recommends and nominates the following Academy members for election to the named offices.

<b>President-Elect</b>	ROBERT W. BOYLE MILWAUKEE, WISCONSIN
<b>Vice-President</b>	MAX KARL NEWMAN DETROIT, MICHIGAN
<b>Secretary</b>	HARRIET E. GILLETTE CLEVELAND, OHIO
<b>Treasurer</b>	JAMES W. RAE, JR. ANN ARBOR, MICHIGAN
<b>Board of Governors</b> (three year term)	GLENN GULLICKSON, JR. MINNEAPOLIS, MINNESOTA

The offices listed are those elective offices that are vacant or will be vacant at the close of the 1960 annual session. The office of President will be automatically assumed by the President-Elect, Ray Piascoski. The office of immediate Past-President will be automatically assumed by the present President, Clarence W. Dail. The present incumbent elected members of the Board of Governors, Morton Hoberman and Herman L. Rudolph, will have terms of one year and two years, respectively, of service on the Board after the 1960 annual session.

This slate of nominees is submitted in accordance with Article XII, Section 3(c) of the By-Laws.

Respectfully submitted,  
**NOMINATING COMMITTEE**  
A. B. C. KNUDSON, *Chairman*  
FRANK H. KRUSEN  
EDWARD W. LOWMAN

\* \* \*

### ARTICLE XII — COMMITTEES

#### SECTION 3. *Duties of Standing Committees.*

(c) **THE NOMINATING COMMITTEE.** The Nominating Committee shall publish at least 30 days before the Annual Session, in the **ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION**, and shall present to the appropriate Executive Session of each Annual Session the names of members whom it recommends and nominates for election to offices or positions that are then vacant or will be vacant at the close of the Annual Session. However, any voting member of the Academy may nominate from the floor. Election shall be by majority vote of those present and voting. The report of the Nominating Committee, nominations from the floor, if any, and the election shall be a special order of business one hour after the scheduled time for the opening of the last Executive Session of the Annual Session.

(Excerpt from By-Laws, American Academy of Physical Medicine and Rehabilitation as of August, 1959.)



## IMPORTANT NOTICE TO ACADEMY MEMBERS

Please take notice the following amendments to the By-Laws of the American Academy of Physical Medicine and Rehabilitation will be presented to the general membership for acceptance or rejection at the annual business session, The Mayflower, Washington, D. C., August 21, 1960.

### ARTICLE III — MEMBERSHIP

#### *Section 2. Active Members*

(a) Qualifications. To be eligible for nomination to active membership, a person must be a certificant of the American Board of Physical Medicine and Rehabilitation.

(b) Election. An eligible person may be nominated for active membership by two active members, one to act as proposer and the other as seconder, in writing to the Chairman of the Membership Committee, supplying such information and executing such application or nomination form as the Committee shall require. The Membership Committee shall consider all applications and send to the membership, at least three months prior to the Annual Session, the names of all nominees whom the Committee proposes to present for election as active members. The Committee shall not, however, present for election any nominee concerning whom it has received written objections from ten or more members by at least thirty days prior to the Annual Session, if in the opinion of the Committee, the objections are valid. The nominees presented by the Committee shall come up in Executive Session for election or rejection by the membership. A nominee shall be elected on the favorable vote of two-thirds of the members present and voting.

**Amend Article III, Section 2(b), to read as follows:**

(b) Election. A diplomate of the American Board of Physical Medicine and Rehabilitation may be nominated for active membership by two active members, one to act as proposer and the other as seconder, in writing to the Chairman of the Membership Committee, supplying such information and executing such nomination form as the Committee shall require. Each year the Membership Committee shall be notified by the Executive Secretary of the Academy of the names of the diplomates who have become eligible for membership, and upon such notification, the Committee, by registered mail, shall request that member who served as the advisor for the diplomate's specialty training to act as the proposer and to be also responsible for obtaining the necessary seconder. This action by the Committee shall constitute the required function of the

Committee in the solicitation of nominations for membership. Any subsequent consideration and nomination of a diplomate for membership shall be the responsibility of individual Academy members. The Membership Committee shall consider all nominations for active membership and shall send to the membership, at least three months prior to the Annual Session, the names of all nominees whom the Committee proposes to present for election as active members. The Committee shall not, however, present for election any nominee concerning whom it has received written objection from ten or more members by at least thirty days prior to the Annual Session, if in the opinion of the Committee the objections are valid. The names of the nominees presented by the Committee shall be brought up in an Executive Session of the Annual Session for election or rejection by the membership. A nominee shall be elected on the favorable vote of two-thirds of the members present and voting. Following the election, the President, by registered mail, shall notify a newly elected member of his election as a Fellow of the Academy.

### ARTICLE IV — OFFICERS

#### *Section 5. Rights and Duties.*

(a) President. The President shall preside at all meetings and gatherings of the Academy and of the Board of Governors. He shall perform such other duties and exercise such other rights as these By-Laws and custom or parliamentary usage may require or as the Board of Governors shall direct.

**Amend Article IV, Section 5(a), to read as follows:**

(a) President. The President shall preside at all meetings and gatherings of the Academy and of the Board of Governors. He is empowered to appoint, with the approval of the Board of Governors, a qualified individual member to serve in a liaison capacity between the Academy and another professional organization with a common interest; such appointment to be for a period of three years unless the need for liaison is temporary and a shorter period of time is indicated, and the President shall designate the appropriate body of the Academy to whom the member so appointed shall report. The President shall perform such

other duties and exercise such other rights as these By-Laws and custom or parliamentary usage may require or as the Board of Governors shall direct.

#### ARTICLE VII — MEETINGS AND EXECUTIVE SESSIONS

*Section 3. Order of Business.* The Academy at any Executive Session shall proceed in the order of business set by the Board of Governors. At any Executive Session, however, the Academy by specific motion may change the order of business previously set by the Board and proceed thereunder in accordance with the terms of the motion.

**Amend Article VII, Section 3, to read as follows:**

*Section 3. Order of Business.* The Academy at any Executive Session shall proceed in the order of business set by the Board of Governors, which shall be distributed to the members prior to the beginning of the Executive Session. At any Executive Session, however, the Academy by specific motion may change the order of business previously set by the Board and proceed thereunder in accordance with the terms of the motion.

#### ARTICLE XII — COMMITTEES

*Section 1. The Standing Committees.* The standing committees of the Academy consist of:

- (a) The Membership Committee;
- (b) The Scientific Program Committee;
- (c) The Nominating Committee, and
- (d) The Advisory Committee for the Advancement of Physical Medicine and Rehabilitation

*Section 2. Composition, Term and Appointment of Standing Committees.*

(a) The Membership, Scientific Program and Nominating Committees each shall consist of three members, appointed by the President for terms so arranged that annually the President shall appoint one member of each committee to serve a term of three years. The member of each committee serving his third year shall be designated as chairman of the committee.

(b) The Advisory Committee for the Advancement of Physical Medicine and Rehabilitation shall consist of seven members. The immediate Past-President shall be the chairman of the committee. Upon the establishment of the committee the President shall appoint two members for a term of one year each; and, two members for a term of three years each. Thereafter, each new President shall appoint two members to the committee for a term of three years each.

(c) If a member of any standing committee dies, resigns or becomes disqualified, the

President may appoint a successor to serve for the unexpired portion of the term.

#### *Section 3. Duties of Standing Committees.*

(a) *The Membership Committee.* The Membership Committee shall perform such duties as are consistent with the provisions of Article III of these By-Laws, in informing the membership as to its estimation of the qualifications of applicants for membership.

(b) *The Scientific Program Committee.* The Scientific Program Committee shall arrange for the scientific program and scientific exhibits to be presented at each Annual Session.

(c) *The Nominating Committee.* The Nominating Committee shall publish at least 30 days before the Annual Session, in the ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION, and shall present to the appropriate Executive Session of each Annual Session the names of members whom it recommends and nominates for election to offices or positions that are then vacant or will be vacant at the close of the Annual Session. However, any voting member of the Academy may nominate from the floor. Election shall be by majority vote of those present and voting. The report of the Nominating Committee, nominations from the floor, if any, and the election shall be a special order of business one hour after the scheduled time for the opening of the last Executive Session of the Annual Session.

(d) *The Advisory Committee for the Advancement of Physical Medicine and Rehabilitation.* The primary duty of this committee is to be a study group, exploring all possibilities, ways and means to advance the specialty of Physical Medicine and Rehabilitation. The recommendations of the committee shall be forwarded to the Board of Governors for action or implementation. This committee will serve in an advisory capacity to the Board of Governors.

*Section 4. Other Committees.* Except as may conflict with the duties of the standing committees, the Academy or the President may appoint any other committees, so constituted and for such purposes as the Academy or the President, as the case may be, may see fit, provided however, that a presidential committee may not be created for a term in excess of one year.

**Amend Article XII, to read as follows:**

*Section 1. The Standing Committees.* The standing committees of the Academy shall consist of:

- (a) The Membership Committee
- (b) The Scientific Program Committee
- (c) The Nominating Committee
- (d) The Advisory Committee for the Advancement of Physical Medicine and Rehabilitation

- (c) The By-Laws Committee
- (f) The Committee on Medical Practice
- (g) The Committee on Equipment and Facilities

*Section 2. Composition, Term and Appointment of Standing Committees.*

(b) The Advisory Committee for the Advancement of Physical Medicine and Rehabilitation shall consist of seven members. The immediate Past-President shall be Chairman of the Committee. Each new President shall appoint two members to the Committee for a term of three years each.

(c) The By-Laws Committee, the Committee on Medical Practice, and the Committee on Equipment and Facilities shall each consist of six members appointed by the President for terms so arranged that annually the President shall appoint two members to each Committee to serve for a term of three years. A member of a Committee serving his third year shall be designated by the President as the Chairman of that Committee.

(d) The Chairman of a standing committee, with the approval of the President, may appoint necessary sub-committees to consider and report to the Committee on specific problems within the Committee's jurisdiction. A duly appointed member of the standing committee shall be designated as the chairman of a sub-committee; however, the other members of the sub-committee may be drawn from members of the Academy who are in good standing.

(e) If a member of any standing committee dies, resigns, or becomes disqualified, the President may appoint a successor to serve for the unexpired portion of the term.

*Section 3. Duties of Standing Committees.*

- (a) The Membership Committee.  
(no change)
- (b) The Scientific Program Committee.  
(no change)

- (c) The Nominating Committee.  
(no change)
- (d) The Advisory Committee for the Advancement of Physical Medicine and Rehabilitation. (no change)

(e) The By-Laws Committee. The By-Laws Committee shall consider either upon its own initiative or by reference from the Board of Governors of the Academy proposed revisions or amendments of the By-Laws and shall report its recommendations to the Academy in accordance with Article XIII of the By-Laws.

(f) The Committee on Medical Practice. The Committee on Medical Practice either upon its own initiative or by reference from the Board of Governors shall consider and report to the Board of Governors and the Academy on all matters related to professional, economic, and ethical factors in the practice of Physical Medicine and Rehabilitation.

(g) The Committee on Equipment and Facilities. The Committee on Equipment and Facilities either upon its own initiative or by reference from the Board of Governors shall consider and report to the Board of Governors and the Academy on all matters related to therapeutic and diagnostic equipment, orthotic and prosthetic devices, and the physical organization of centers and facilities concerned with Physical Medicine and Rehabilitation.

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These amendments are presented in accordance with Article XIII — Amendments:

These By-Laws may be amended at any session, annual or special, by the vote of at least two-thirds of the active and senior members present and voting, provided that any proposed amendment (1) has been submitted in writing to the Secretary and (2) notice thereof has been mailed to each voting member or has been inserted in the official publication at least one month prior to the session at which it is acted on.



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# American Academy of Physical Medicine and Rehabilitation

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1960



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# CONTENTS



3rd International Congress of Physical Medicine General Information and Preliminary Program .....	261
◇	
Decrease in Muscle Spasm Produced by Ultrasound, Hot Packs, and Infrared Radiation. Freeman P. Fountain, M.D.; Jerome W. Gersten, M.D., and Orhan Sengir, M.D. ....	293
◇	
Electromyographic Findings in Adults with Myxedema: Report of 16 Cases. Ridvan R. Ozker, M.D.; O. Peter Schumacher, M.D., and Paul A. Nelson, M.D. ....	299
◇	
Special Problems in Total Medical Care of the Handicapped Patient After Hospital Discharge: Two Case Reports. Olav Austlid, M.D. ....	308
◇	
Survey of Selected Literature .....	311
◇	
American Congress of Physical Medicine and Rehabilitation — Amendments to Constitution and By-Laws .....	325
◇	
American Academy of Physical Medicine and Rehabilitation — Nominating Committee Report .....	332
◇	
American Academy of Physical Medicine and Rehabilitation — Amendments to By-Laws .....	333



Editor of the Month, ARTHUR L. WATKINS, M.D., Boston



